Second Five-Year Review Report

For

Paoli Rail Yard
Chester County, Pennsylvania

PREPARED BY:

U. S. Environmental Protection Agency, Region III
Philadelphia, Pennsylvania

Approved by:

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Hazardous Site Cleanup Division
U.S. EPA, Region III

Date:

5/5/2011

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TABLES

ATTACHMENTS

List of Acronyms

APU	American Premier Underwriters, Inc.
ARAR	Applicable or Relevant and Appropriate Requirement
BTEX	Benzene, Toluene, Ethylbenzene, and Xylene (total) compounds
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DRO	Diesel-Range Organics
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Differences
FS	Feasibility Study
GRO	Gasoline-Range Organics
MCL	Maximum Contaminant Level
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PADEP	Pennsylvania Department of Environmental Protection
PADER	Pennsylvania Department of Environmental Resources
PCB	Polychlorinated Biphenyl
PCOR	Preliminary Close Out Report
PRP	Potentially Responsible Party
QA/QC	Quality Assurance/Quality Control
RAO	Remedial Action Objective
RD/RA	Remedial Design and Remedial Action
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
SARA	Superfund Amendments and Reauthorization Act
SEPTA	Southeastern Pennsylvania Transportation Authority
SPL	Separate-Phase Liquid
TBC	To Be Considered
UAO	Unilateral Administrative Order
UMC	Unicorn Management Consultants, LLC
VOC	Volatile Organic Compound

Executive Summary

The United States Environmental Protection Agency's (EPA's) remedy for the Paoli Rail Yard (Site) in Paoli, Chester County, Pennsylvania, was set forth in a Record of Decision (ROD) issued on July 21, 1992, as modified by the issuance of an Explanation of Significant Differences (ESD) on April 2, 1997, by a second ESD issued on September 14, 2004 and by a third ESD issued on March 29, 2005. The ROD, as modified by the ESDs, herein is collectively referred to as the remedy. The remedy delineates the remedial action selected to address contamination at the Site.

In addition to addressing soils and sediments contaminated by polychlorinated biphenyls, commonly known as PCBs, the remedy includes ground water treatment and monitoring to ensure that the former rail yard is not a continuing source of contamination to ground water. The major components of the remedy include excavation, stabilization, and containment of PCB-contaminated soils and stream sediments; installation of erosion and sedimentation controls to manage and control storm water runoff and erosion from the rail yard property; decontamination and demolition of old rail yard buildings and structures; pumping and treatment of contaminated ground water at the rail yard; long-term ground water monitoring in both Site monitoring wells and domestic supply wells; and placement of restrictions to limit the use of the rail yard property.

Cleanup activities necessary to implement the remedy began on May 7, 2001 with the start of the remedial action at the rail yard portion of the Site. Cleanup of areas outside the rail yard began in November 2001. The entire Site achieved construction completion status with the signing of a Preliminary Close-Out Report (PCOR) on July 12, 2005.

The first Five-Year Review for the Site, completed on May 5, 2006, found the remedy to be constructed in accordance with the requirements of the ROD, as modified by the ESDs, and functioning as designed. The assessment of the Site by this, the second Five-Year Review, finds that the remedy continues to be protective of human health and the environment. Cleanup goals have been achieved on the rail yard property and at residential properties. The majority of PCB-contaminated sediments have been removed from impacted stream areas, and ongoing sediment removal activities continue to restrict the migration of PCBs. In the past two years, elevated PCB concentrations have been consistently observed at sediment monitoring location CHFP16. If the results from the autumn 2011 annual monitoring event are elevated at this location, steps will be taken to identify the source of the contamination. Engineering controls constructed as part of the remedy, including the containment cell, storm water management system, asphalt cover, retaining walls, and security fencing, are operating as designed and prevent direct contact with contaminated soils that remain at the rail yard property. The recovery and treatment system has effectively removed fuel oil, reduced benzene concentrations, and prevented the off-site migration of contaminated ground water. Benzene concentrations have been further reduced through in-situ chemical oxidation and aerobic bioremediation conducted as part of an on-going pilot study. All institutional controls are in place and functioning as anticipated.

Regularly scheduled monitoring and sampling of both rail yard and non-rail yard properties continues to occur as part of operation and maintenance (O&M) activities. Stream monitoring and sediment removal occurs quarterly as part of routine O&M activities. The pilot study has been implemented in place of the recovery and treatment system since 2007 to further reduce benzene concentrations.

Government Performance Review Act (GPRA) Measure Review

The GPRA holds federal agencies accountable for using resources wisely and achieving program results. As part of this Five-Year Review, two environmental indicators (EI) and one land revitalization measure were reviewed. The status of these measures is presented below:

Performance Measure	Progress Category/Status
Site-Wide Human Exposure EI	Current human exposure under control
Contaminated Groundwater Migration EI	Contaminated groundwater migration under control
Site-Wide Ready for Anticipated Use (RAU)	Site meets conditions for Site-Wide RAU status, achieved on March 18, 2011

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name: Paoli Rail Yard		
EPA ID: PAD980692594		
EPA Region: III	**State:** Pennsylvania	**City/County:** Paoli/Chester
SITE STATUS		
NPL status: ☑ Final ☐ Deleted ☐ Other (specify)		
Remediation status: ☐ Under Construction ☑ Operating ☑ Complete		
Multiple OUs? ☑ YES ☐ NO	**Construction completion date:** 07/12/2005	
Has Site been put into reuse? ☐ YES ☑ NO		
REVIEW STATUS		
Lead agency: ☑ EPA ☐ State ☐ Tribe ☐ Other Federal Agency		
Author name: Christopher Sklaney		
Author title: Remedial Project Manager	**Author affiliation:** U.S. EPA Region III	
Review period: 09/2010 to 05/2011		
Date(s) of Site inspection: 12/01/2010, 12/02/2010		
Type of review: ☑ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only ☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead		
Review number: ☐ 1 (first) ☑ 2 (second) ☐ 3 (third) ☐ Other:		
Triggering action: Previous Five-Year Review Report		
Triggering action date (from WasteLAN): 05/5/2006		
Due date (five years after triggering action date): 05/5/2011		

Issues:

Elevated PCB concentrations have been observed at sediment monitoring location CHFP16 in the Cedar Hollow tributary.

Recommendations and Follow-up Actions:

Evaluate the analytical results of the next annual sediment monitoring event, scheduled for autumn 2011. If the results are elevated, take steps to identify the source of PCB contamination at sediment monitoring location CHFP16.

Protectiveness Statement:

The assessment of the Site finds that the remedy has been constructed in accordance with the requirements of the ROD, as modified by the ESDs, and is functioning as designed. The remedy is protective of human health and the environment. Cleanup goals have been achieved on the rail yard property and at residential properties. The majority of PCB-contaminated sediments have been removed from impacted stream areas, and ongoing sediment removal activities continue to restrict the migration of PCBs. In the past two years, elevated PCB concentrations have been consistently observed at sediment monitoring location CHFP16. If the results from the autumn 2011 annual monitoring event are elevated at this location, steps will be taken to identify the source of the contamination. Engineering controls constructed as part of the remedy, including the containment cell, storm water management system, asphalt cover, retaining walls, and security fencing, are operating as designed and prevent direct contact with contaminated soils that remain at the rail yard property. The recovery and treatment system has effectively removed fuel oil, reduced benzene concentrations, and prevented the off-site migration of contaminated ground water. Benzene concentrations have been further reduced through in-situ chemical oxidation and aerobic bioremediation conducted as part of an on-going pilot study. All institutional controls are in place and functioning as anticipated.

I. Introduction

The purpose of the Five-Year Review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and identify recommendations to address them.

The U.S. Environmental Protection Agency (the Agency or EPA) is preparing this Five-Year Review Report pursuant to Section 121(c) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the National Contingency Plan (NCP). CERCLA §121(c) provides:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action.*

The Agency interpreted this requirement further in the NCP in the Code of Federal Regulations (CFR) at 40 CFR §300.430(f)(4)(ii) which provides:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

This is the second Five-Year Review for the Site. The triggering action for this statutory review is the completion of the first Five-Year Review, which is documented as May 5, 2006. This review was conducted for the entire Site from September 2010 through May 2011 by the assigned Remedial Project Manager (RPM). This report documents the results of the review.

The Five-Year Review is required because the remedy implemented resulted in hazardous substances being left on-site. Specifically, hazardous substances remain in the rail yard soils, in an on-site containment cell, and in the ground water beneath the rail yard at concentrations which do not allow for unlimited use and unrestricted exposure.

II. Site Chronology

Table 1. Chronology of Site Events

Event	Date
EPA and the Pennsylvania Department of Environmental Resources (now Pennsylvania Department of Environmental Protection or PADEP) inspect the rail yard.	Late 1970s
Samples made available to the EPA, indicate severe PCB problem at rail yard.	1985
EPA files complaint seeking to require Rail Companies to limit access and control movement of PCBs from yard, conduct sampling, and clean up contamination.	1986
Rail Companies install fencing to limit public access to rail yard.	1986
Site proposed to the National Priorities List (NPL) of hazardous waste sites.	January 22, 1987
EPA paves the parking lot and high-use areas of the yard to prevent the spread of PCBs.	1987
Rail Companies begin investigation to determine the nature and extent of contamination.	1987
Rail Companies remove soil with PCB concentration more than 50 milligrams per kilogram (mg/kg, also parts per million or ppm) from nearby residential properties and install fence around wooded area exceeding 50 mg/kg.	1988
EPA constructs basins on the rail yard to prevent further erosion of PCB-contaminated soils.	1989
Rail Companies remove soil with PCB concentrations exceeding 10,000 mg/kg from rail yard.	1990
Site added to NPL by publication in the Federal Register.	August 30, 1990
Rail Companies install and operate a fuel oil recovery and ground water treatment system.	1990
EPA issues a Record of Decision (ROD) selecting the final cleanup remedy for the Site.	July 21, 1992
EPA begins design for cleanup of residential and stream areas located near the rail yard.	1994
Rail Companies permanently shut down rail yard operations at the Paoli facility.	January 1995
EPA issues an order to American Premier Underwriters, Inc. (APU), successor to Penn Central Corporation, to conduct the cleanup of contaminated areas outside the rail yard.	September 30, 1996
EPA issues an Explanation of Significant Differences (ESD) changing the alternative selected in the ROD to provide for demolition of rail yard buildings no longer in use.	April 2, 1997

Table 1. Chronology of Site Events

Event	Date
Rail Companies sign an order agreeing to conduct the design of the rail yard remedy.	April 17, 1997
Court approves settlement between U.S. and Rail Companies for cleanup of the rail yard.	April 1999
Rail Companies begin removal of rail track and ties located in areas requiring soil removal.	1999
EPA approves Rail Companies' final design for acceptance of non-rail yard soils.	June 26, 2000
EPA approves Rail Companies' final design for the cleanup of rail yard soils.	September 29, 2000
Rail Companies issue Notice to Proceed to contractor to initiate rail yard remedy.	February 2001
Rail Companies begin construction of the rail yard remedial action.	May 7, 2001
EPA approves APU's final design for the cleanup of residential properties, its contractor, Unicorn Management Consultants, LLC (UMC) begins cleanup where access was granted.	November 2001
With EPA approval, UMC removes PCB-contaminated soils and sediments from the certain stream areas where PCB concentrations exceed 25 mg/kg.	December 2001
EPA approves APU's final design for the cleanup of stream areas and UMC proceeds with the cleanup of remaining areas where access has been granted by property owners.	July 2004
EPA issues an ESD to allow for off-site disposal of PCB-contaminated soils/sediments.	September 14, 2004
APU submits final remedial action completion reports for non-rail yard remedy.	February 2005
EPA issues third ESD allowing an existing rail tie pile to remain, establishing benzene performance standard for ground water, and allowing future changes to monitoring program.	March 29, 2005
EPA, PADEP and Rail Companies conduct inspection of the rail yard and determine the remedy is constructed in accordance with design and specifications. Minor items needing repair noted.	May 11, 2005
EPA, PADEP and APU conduct inspection of the non-rail yard portion of the Site and determine the remedy is constructed in accordance with design plans.	May 24, 2005
EPA and Rail Companies conduct final inspection. Items noted previously were addressed.	June 7, 2005
Preliminary Close-out Report (PCOR) signed by the Director of the EPA, Region 3, Hazardous Site Cleanup Division indicating that the construction phase of the Site remedy is complete.	July 12, 2005
Rail Companies submit final construction completion reports for rail yard remedy.	November 2005

Table 1. Chronology of Site Events

Event	Date
Site inspection of the non-rail yard remedy conducted for the first Five-Year Review.	March 9, 2006
Site inspection of the rail yard remedy conducted for the first Five-Year Review.	March 31, 2006
First Five-Year Review issued.	May 5, 2006
Rail Companies initiate in-situ chemical oxidation and aerobic bioaugmentation pilot study at the Rail Yard Property.	November 2007
Site inspection of the rail yard remedy for the second Five-Year Review.	December 1, 2010
Site inspection of the non-rail yard remedy for the second Five-Year Review.	December 2, 2010

III. Background

Physical Characteristics

The Site is located in the town of Paoli in Chester County, Pennsylvania. Portions of the Site are located in both Willistown and Tredyffrin Townships. The Site consists of the 28-acre former Paoli rail yard facility, and includes ground water beneath the rail yard and stream sediment in the watershed north of the rail yard impacted by Site-related contaminants. The Harrisburg Rail Line, which passes through the rail yard, is used for passenger and freight transportation. The Site includes the recovery and treatment system and infiltration gallery, extraction and monitoring wells, containment cell, and storm water management basins located on the rail yard. The cell, which contains approximately 80,000 cubic yards of PCB-contaminated soils that have been stabilized with cement, currently appears as a grass-covered hill. No permanent buildings are located on the rail yard property.

The rail yard property is located on the northern edge of a prominent regional ridge underlain by metamorphic rocks (schist) of the Wissahickon Formation. Chester Valley, which is underlain by carbonate and fine-grained clastic rocks, is located to the north. The relief between the ridge on which the rail yard property is located and Chester Valley is several hundred feet, and the topography between contains numerous deeply incised, high-gradient streams. Natural drainage from the Site is toward the north to Little Valley Creek through one of three tributaries: Cedar Hollow, Hollow Road, or North Valley. Cedar Hollow and Hollow Road tributaries flow together for several hundred feet before the confluence with Little Valley Creek, which subsequently flows into Valley Creek and the Schuylkill River. Drainage patterns from the Site have been modified through the remedy and are now controlled through a storm water management system, the outfall of which flows through two storm water detention basins and into the Cedar Hollow and Hollow Road tributaries. The Site, including rail yard and non-rail yard portions, is presented on a map included as Attachment 1.

Land and Resource Use

The former rail yard property is currently not in use. The only regular activities conducted on the property are tasks associated with O&M of the remedy. The area surrounding the rail yard property is residential and commercial. The rail yard is bordered by residential properties to the north and commercial properties to the east, west and south. The surrounding area is serviced by public water, although four local residences continue to utilize ground water obtained from private domestic supply wells as a potable water source.

History of Contamination

The rail yard, which dates back to 1915, was previously used for storage and maintenance of passenger rail cars. The yard was originally designed to accommodate the repair of steam powered rail cars. The rail lines were later converted to electric power, at which time mineral oil was used to insulate electronics within transformers in the cars. In the 1950s, a group of synthetic compounds manufactured exclusively by Monsanto Corporation under the trade name "Aroclor" and collectively referred to as PCBs replaced the mineral oil in the transformers. PCBs were favored for use in transformers due to their chemical stability, electrical insulation effectiveness, and low flammability. In 1979, EPA banned the manufacture of PCBs and began to phase out their use. Southeastern Pennsylvania Transportation Authority (SEPTA) replaced the PCB fluids in the transformers with other coolants as part of a program which was completed in 1986.

In the late 1970s, both EPA and the Pennsylvania Department of Environmental Resources (now the Pennsylvania Department of Environmental Protection or PADEP) inspected the rail yard and identified several areas of potential contamination. PCBs found in the soils and sediments at the Site were likely released during servicing and operation of the rail cars. The Rail Companies, a collective comprised of SEPTA, National Railroad Passenger Corporation (Amtrak), and Consolidated Rail Corporation (Conrail, formerly Penn Central Railroad and renamed American Premier Underwriters, or APU), were required to determine the extent of contamination and to correct any problem areas. Sampling conducted by the Rail Companies from 1980 through 1984 indicated a severe PCB problem at the rail yard. In 1986, EPA filed a complaint seeking an order to require the Rail Companies to limit access to the rail yard, control movement of PCBs from the rail yard, conduct sampling and analysis, and to clean up the rail yard. Based on the results of these early investigations, EPA proposed the Site to the NPL on January 22, 1987, and it was formally added to the NPL on August 30, 1990.

Initial Response

Early measures to reduce exposure to PCB contamination were initiated in 1986 when, pursuant to an agreement with the United States, the Rail Companies installed a fence to restrict access to the property. In 1987, EPA reduced the spread of PCB contamination by paving the parking lot and other high use areas of the yard and by constructing several storm water basins.

Beginning in 1988, the Rail Companies removed PCB-contaminated soil from 35 nearby residential properties found to contain PCBs at concentrations exceeding EPA's removal action level of 50 milligrams per kilogram (mg/kg, equivalent to parts per million or ppm). Approximately 3,500 cubic yards of contaminated soils were placed on the rail yard in a lined containment cell. In 1990, the Rail Companies excavated PCB-contaminated soils from areas of the rail yard found to contain PCBs at concentrations greater than 10,000 mg/kg. These soils, approximately 150 cubic yards, were sent to an approved disposal facility. In 1990, the Rail Companies also installed and began operating a ground water treatment and fuel oil recovery system to address contamination in the vicinity of the rail car maintenance building.

Basis for Taking Remedial Action

Early sampling identified PCBs in rail yard soils and in residential soils and stream sediments in areas located near the rail yard. Additionally, fuel oil and BTEX compounds (benzene, toluene, ethyl benzene, and xylene) were detected in sampling results from soil and ground water sampling conducted on the rail yard. Although the surface runoff appeared to be the primary contaminant migration pathway for PCBs from the rail yard, possible migration of contaminated ground water attributable to the rail yard was also a concern.

In 1987, with EPA's oversight, the Rail Companies began a Remedial Investigation (RI) and Feasibility Study (FS) to determine the nature and extent of PCB contamination associated with the Site. The investigation included sampling of the rail yard and adjacent properties. The RI/FS reports were finalized in 1991. Based on the results of the RI/FS, EPA determined that potential risks to human health and the environment were unacceptable and warranted remedial action.

The two contaminants of concern are PCBs and benzene. During the initial RI, high concentrations of PCBs were detected in soils on the rail yard property primarily in track areas and in the vicinity of the former rail car maintenance shop. PCB contamination was also detected in soils on residential properties and in sediments in nearby tributaries and streams. Fuel oil and BTEX compounds were identified in soil samples collected in the vicinity of the rail car maintenance shop and in ground water beneath the rail yard. Current features of the rail yard property are presented in Attachment 2.

IV. Remedial Actions

Remedy Selection

The ROD was issued on July 21, 1992. Remedial Action Objectives (RAOs) were developed as a result of data collected during the RI/FS to aid in the development and screening of remedial alternatives to be considered for the ROD. The RAOs outlined in the ROD are as follows:

- Source control of rail yard soils contaminated with PCBs to prevent exposure through direct contact and prevent degradation of downstream areas from off-site migration;

- Decontamination of buildings and structures on the rail yard property to minimize exposure of persons working on the Site;

- Excavation of residential soils contaminated with PCBs to prevent exposure through direct contact;

- Recovery of fuel oil in the vicinity of the rail yard car shop building to the maximum practicable extent and treatment of ground water to prevent degradation of the aquifer;

- Excavation of sediments in streams and tributaries to provide adequate protection of human health and the environment.

On April 2, 1997, the ROD was modified through the issuance of an ESD. As discussed previously, when the remedy was selected in 1992, the rail yard was an active maintenance facility. In 1995, SEPTA relocated maintenance operations to another facility. The 1997 ESD changed the Rail Yard and Buildings alternative selected in the ROD from decontamination solely to decontamination and demolition. Additionally, the worker protection stipulation detailed in the ROD was discontinued as workers were no longer in the car shop.

On September 14, 2004, EPA issued a second ESD to further modify the remedy to allow for off-site disposal of PCB-contaminated soils and sediments. When the ESD was issued, all non-rail yard soils and sediments with PCB concentrations exceeding 25 mg/kg had been excavated, stabilized in a cement-soil mixture, and placed in the containment cell on the rail yard. In addition, the cleanup of the rail yard, including stabilization of PCB-contaminated soils, was nearly complete and the rail yard was scheduled for final grading and restoration. The Rail Companies indicated that it would not be practical to accept any additional non-rail yard soils or sediments once restoration efforts began. Moreover, the Rail Companies anticipated that stream sediments would likely be too wet to be placed on the rail yard. To address these concerns, the ESD was issued to permit PCB-contaminated soils and sediments from the Site to be transported to an approved off-site facility, as necessary.

On March 29, 2005, EPA issued a third ESD that permitted modification of the remedy to 1) allow an existing rail tie pile to remain in place; 2) establish that the sole performance standard for benzene in ground water at the Site was 5 micrograms per liter (µg/L, equivalent to parts per billion or ppb); and 3) permit EPA the flexibility to modify the analytical parameters for the containment cell ground water monitoring program based on results of future monitoring.

To assist in tracking the progress of various activities pursuant to the remedy, EPA separated the Site into two parts, or Operable Units (OUs). Performance standards, or cleanup goals, were established for the target contaminants in all or part of each OU. The performance standards outlined as part of the remedy are outlined in Table 2.

Table 2. Performance Standards

Operable Unit	Description	Contaminant	Performance Standard
OU-1	Residential surface soils	PCBs	2 mg/kg[1]
	Stream sediments	PCBs	1 mg/kg
OU-2	Rail yard soils	PCBs	25 mg/kg
	Ground water[2]	Benzene	5 µg/L
	Former car shop area	Fuel oil[3]	Remove to maximum possible extent

[1]Average concentration on an individual property
[2]In the vicinity of the former car shop
[3]Primarily degraded #2 fuel oil

Remedy Implementation

OU-1 comprises the approximately 400 acres of residential, commercial, and stream areas outside the rail yard property. OU-2 comprises the 28-acre rail yard property that includes the rail yard soils and ground water contamination. All cleanup activities are being conducted by the individual responsible parties under EPA's oversight. Remediation activities are being conducted by APU and the Rail Companies in response to OU-1 and OU-2, respectively.

Non-Rail Yard Remedy (OU-1)

APU has been responsible for cleanup of contaminated residential and stream areas pursuant to a Unilateral Administrative Order issued by EPA to APU on September 30, 1996 [EPA Docket No. III-96-89-DC]. APU retained Unicorn Management Consultants, LLC (UMC) to design and construct the non-rail yard remedy. UMC also provided on-site construction quality assurance monitoring.

Remediation of contaminated non-rail yard areas began in November 2001. While the final cleanup goals for residential and stream areas are 2 mg/kg and 1 mg/kg, respectively, areas containing soils and sediments with PCB concentrations exceeding 25 mg/kg, which required treatment at the rail yard, were prioritized for cleanup. Approximately 1,200 cubic yards of soils with PCB concentrations greater than 25 mg/kg were removed and delivered to the rail yard. Sampling results, collected following the cleanup, indicate that all PCB-contaminated soils and sediments with concentrations greater than 25 mg/kg were removed from local residential properties and stream areas, stabilized at the rail yard, and placed in the containment cell.

From 2001 through 2004, approximately 9,000 cubic yards of non-rail yard soils and sediments with PCB concentrations less than 25 mg/kg but greater than the performance standards were excavated from residential properties and floodplain areas and temporarily stored at the rail

yard. In addition, approximately 150 cubic yards of stream sediments with moisture contents deemed too high for inclusion in the containment cell were transferred to an approved off-site facility, de-watered, and placed in a landfill.

Post-excavation sampling results indicate that the residential performance standard of a property-wide average PCB concentration of 2 mg/kg was achieved on all properties where soils were removed. Following cleanup, the properties were fully restored. Disturbed areas were backfilled with clean soils and graded, as necessary. The properties were seeded with grass and disturbed plantings were replaced, as necessary. All properties were inspected several times within the first two years following the completion of the work to assure the restoration activities were fully successful. No additional activities are planned for the residential properties. All activities are documented in the *Remedial Action Closure Report, Non-Rail Yard Site Property (Residential Portion of the Remedy), Paoli Rail Yard Superfund Site, Chester County, Paoli, PA*, prepared for APU by UMC, November 15, 2004, revised February 9, 2005.

The remedy was constructed to minimize the destruction, loss, and degradation of natural habitat in stream channels and riparian zones during cleanup of PCB-contaminated sediments. To meet this specification, a depositional basin was created during remedy construction at monitoring location CHSD01 to serve as an area where sediments would accumulate through natural fluvial processes. The basin was constructed in the Cedar Hollow tributary approximately 200 feet upgradient of the confluence with Little Valley Creek, where a pneumatically powered industrial vacuum mounted on a vehicle could readily access the location. Sediment removals in areas other than the depositional basins were intended by the remedy to be limited.

In accordance with the remedy, monitoring of the stream areas was to continue for at least five years after implementation to ensure all cleanup goals are met and restoration activities are successful. Sampling analytical results indicate that the majority of PCB-contaminated sediments were removed from both floodplain and in-stream depositional areas impacted by the rail yard, although stream sediments containing PCBs at concentrations above the cleanup standard are still sporadically present. All disturbed floodplain areas were restored. Ongoing maintenance is occurring in accordance with the *Operations and Maintenance Plan for the Tributaries and Creeks, Non-Rail Yard Site Property (Stream Sediment Portion of the Remedy) Paoli Rail Yard Superfund Site, Chester County, Paoli, PA*, prepared for APU by UMC, January 28, 2005. To minimize disturbance to the tributaries and streams and achieve the final 1 mg/kg performance standard in all impacted stream areas, additional sediments are being removed using a vacuum truck as they accumulate in designated deposition areas constructed or established as part of the stream maintenance program. The stream cleanup activities are documented in the *Interim Remediation Report, Non-Rail Yard Site Property (Stream Sediment Portion of the Remedy), Paoli Rail Yard Superfund Site, Chester County, Paoli, PA*, prepared for APU by UMC, February 14, 2005 and annual O&M reports.

Rail Yard Remedy (OU-2)

The remedy for the rail yard property is being implemented by the Rail Companies pursuant to a settlement agreement embodied in a Consent Decree between and among the United States and the Rail Companies which was lodged in Federal court on July 28, 1997 and entered on April 20, 1999 [United States v. SEPTA, Civil Action No. 86-1094 (E.D.Pa)]. The Rail Companies originally retained IT Corporation to provide overall project management and construction quality assurance monitoring of the rail yard remedy. In 2001, AWS Remediation, Inc. was subcontracted to IT Corporation to construct the rail yard remedy. Advanced GeoServices Corporation (AGC) was hired to oversee the implementation of the design and prepare necessary project documents and also maintain the ground water portion of the rail yard remedy.

In January 2002, prior to completion of the rail yard remedy, the Rail Companies terminated their contract with IT Corporation. After IT Corporation left in February 2002, the Rail Companies continued to maintain site security and erosion controls. In June 2002, the Rail Companies contracted with AGC to perform limited cleanup activities. In turn, AGC subcontracted with Sevenson Environmental Services (SES) to perform certain construction-related work. Finally in 2003, the remaining cleanup activities were initiated by SES under a new contract with the Rail Companies. Earth Tech Inc. and its subcontractor, Environ Consultants, Inc. provided construction management, quality assurance, scheduling, and document control during this phase of the project.

Beginning in 1999 during preparation for the soil cleanup, track and rail ties located in areas requiring soil removal were removed and either recycled or sent to an approved disposal facility. Cleanup of the rail yard began in May 2001. Erosion and storm water runoff was controlled with the construction of a retaining wall on the northern boundary of the yard along with the construction of several new storm water basins. With the exception of a few storage sheds, the rail yard buildings were decontaminated, demolished, and disposed of at approved facilities. Excavation and treatment of soils found to contain PCBs in excess of the 25 mg/kg performance standard was completed in 2004.

Contaminated rail yard soils were excavated and stockpiled in and around the former maintenance shop where they were then stabilized and placed in the containment cell. The initial step in the stabilization process involved screening contaminated soils to remove oversized materials. The soils, which typically contained a large amount of ash from early rail operations, were then mixed with a reagent soil which contained a greater percentage of clay. This mixture was then fed into a pug mill where cement and water were added. Once mixed, the resulting material was transported in dump trucks to the on-site containment cell where it was spread and compacted. As the cement cured the contaminated soils were bound up, thereby completing the stabilization process and preventing further migration of contaminated soils. A total of approximately 80,000 cubic yards of stabilized soils, were placed in the on-site containment cell. The containment cell was then capped with synthetic materials to prevent contact with the stabilized soils and to prevent degradation of the cell. To complete the cell, a layer of top soil was added and the cell was seeded with a grass mixture. All disturbed areas of the rail yard were backfilled with clean soils and stone, the property was graded and final storm water controls were completed.

The ground water portion of the cleanup began in 1990, before the issuance of the ROD. Ground water monitoring wells were installed during the RI to evaluate water quality and flow direction in ground water in the vicinity of the rail yard. Fuel oil was detected in soil and ground water in the area of the rail yard where the former maintenance shop was located. The oil which leaked into the ground in this area was found to contain PCBs and elevated levels of benzene. To recover the oil and prevent possible migration of contaminated ground water, the Rail Companies installed a fuel oil recovery and ground water treatment system on the rail yard. The area, referred to as the fuel oil soils area, was also covered with an asphalt cap to prevent direct contact with the contaminated soils and to limit infiltration of rainwater to the ground water. The remedy does not require removal of the fuel oil soils, but rather requires that the asphalt cap remain intact and that the fuel oil be removed to the maximum practical extent through operation of the recovery and treatment system. The system was constructed to 1) prevent the off-site migration of contaminants in the vicinity of the former car shop via ground water, 2) extract fuel oil, and 3) extract and treat benzene to achieve the ground water performance standard specified in the remedy. Fuel oil was segregated from ground water via an oil-water separator and transported off-site for disposal. Ground water was treated by carbon adsorption and discharged to an infiltration gallery located on the rail yard property.

Initially, the recovery system included three pumping wells. To increase the volume of oil removed, two additional recovery wells were installed in June 1995. From 1990 through 2003, the system recovered approximately 778 gallons of fuel oil. Due to reductions in the amount of fuel oil recovered, active fuel oil recovery was discontinued in 2003, although the recovery system continued to extract and treat ground water to address benzene contamination. No fuel oil has been identified in the wells during monitoring since recovery was discontinued.

At the time of the first Five-Year Review, one monitoring well located on the rail yard, MW-22, continually contained benzene at concentrations above EPA's performance standard of 5 micrograms per liter (µg/L, also parts per billion or ppb). Benzene was not regularly reported in any other monitoring wells. To address this contamination, EPA approved the conversion of the system to focus solely on extracting ground water from monitoring well MW-22. The conversion was accomplished in January 2005.

Construction completion status was achieved on July 12, 2005 with the signature of the PCOR.

Institutional Controls

Institutional controls are non-engineered administrative and legal controls that help minimize the potential for human exposure to contamination and protect the integrity of the remedy. Institutional controls were placed on the rail yard property to prohibit use for residential and agricultural purposes and to prohibit the use of ground water at the rail yard for domestic purposes. The controls are being implemented and enforced pursuant to a settlement embodied in a Consent Decree between and among the United States and the Rail Companies [United States v. SEPTA. Civil Action No. 86-1094 (E.D.Pa)]. The controls were placed on the property on May 19, 1999

following entry of the Consent Decree. The controls apply only to the rail yard property and are intended to protect the remedy without preventing re-use of the property in a manner that is compatible with the remedy. EPA has evaluated the institutional controls as part of this review and finds they provide the intended protection. No modifications are recommended at this time.

System Operation and Maintenance

The responsible parties for each OU continue to conduct long-term monitoring and maintenance activities according to the individual O&M plans approved by EPA. O&M activities are reported to EPA by the responsible parties in monthly progress reports or quarterly and annual monitoring reports.

Non-Rail Yard Properties (OU-1)

O&M activities for this portion of the remedy are specified in the *Operation and Maintenance Plan for the Tributaries and Creeks – the Non-Rail Yard Site Property (Stream Sediment Portion of the Remedy)*, submitted to EPA by UMC on behalf of APU on January 28, 2005. The majority of PCB-contaminated sediments were removed during the construction phase of the Remedial Action (RA). The amount of sediments contaminated with PCBs above the performance standard has decreased since the first Five-Year Review and concentrations have declined to near cleanup goals. No O&M activities are conducted on the residential properties, where cleanup is complete. The primary aspects of the O&M plan include:

- Monitoring and maintenance of in-stream and floodplain depositional areas remediated and restored as part of the non-rail yard remedy;
- Excavation at natural and engineered depositional areas on a semi-annual or more frequent basis;
- Control and replacement of vegetation in remediated riparian and floodplain areas including monitoring of erosion controls; and
- Fish population and macro-invertebrate studies;

Sixteen in-stream and floodplain locations are currently included in the annual sampling program, including eight locations in the Cedar Hollow tributary, four locations in the Hollow Road tributary, three locations in Little Valley Creek, and one location in Valley Creek. The North Valley tributary is not included in the sampling program since pre-remedial investigations indicated PCBs were not present above the 1 mg/kg performance standard. For the 2009 and 2010 annual sampling events, 12 locations previously sampled in 2001 during pre-remedial investigations were temporarily added to the program to assist with the second Five-Year Review, including five each in the Cedar

Hollow and Hollow Road tributaries, and one each in Little Valley Creek and Valley Creek. A map showing the 16 locations regularly monitored as part of O&M activities and the 12 locations added for the 2009 and 2010 events, is presented in Attachment 3.

The primary sediment deposition area established during construction activities, CHSD01, is located downstream of the confluence of the Cedar Hollow and Hollow Road tributaries. This location is favorable for sediment removal both because it is situated where the energy level of the Cedar Hollow tributary decreases and deposition occurs, and due to the ease of access with a vacuum truck. Approximately 240 cubic yards of sediment has been removed from this deposition area since September 2004. In 2010, EPA and APU agreed to increase the frequency of sediment removal at this location from annually to quarterly to expedite a reduction in PCB concentrations and mitigate the potential for migration further downstream.

Rail Yard Properties (OU-2)

O&M activities for this portion of the remedy are conducted in accordance with the *Inspection and Maintenance Plan for the Rail Yard Remedy, Paoli Rail Yard Superfund Site, Paoli, Pennsylvania*, June 2005 (revised November 2005), submitted to EPA by AGC on behalf of the Rail Companies. The primary aspects of the O&M plan include:

- Quarterly inspection of the containment cell, storm water conveyance system and erosion controls, storm water management basins, asphalt cover area, retaining walls, site security fence and signage, recovery and treatment system, and monitoring wells;

- Operation and maintenance of the recovery and treatment system;

- Quarterly sampling of ground water monitoring wells and annual sampling of private domestic supply wells for Site-related contaminants;

Performance monitoring associated with the remedy for the rail yard property includes ongoing sampling and analysis of ground water in most monitoring wells installed to monitor contamination originating at the Site. Ground water monitoring was been conducted since 1989 and has been modified based on the sampling results and the effectiveness of the recovery and treatment system. Quarterly sampling of monitoring wells associated with the containment cell and asphalt cap area has been conducted since 2002. In addition, AGC collected samples for benzene analysis from monitoring well MW-22 at an approximate frequency of once per month from January 2005 through November 2007. In 2010, EPA approved a reduction in the frequency of sampling due to the site-wide reduction in benzene concentrations. The current monitoring schedule and list of analytical parameters are presented in Table 3. Maps identifying monitoring wells located around the containment cell and asphalt cover areas are presented in Attachment 4 and 5, respectively.

Table 3. Sampling and Monitoring Schedule, Rail Yard Property (as of December 2010)

Monitoring Wells	Number of Sampling/Monitoring Events Per Year					
	VOCs	BTEX only	PCBs	DRO/ GRO	MNA	SPLs
CC-MW-1, CC-MW-2, CC-MW-3, CC-MW-4	2	--	2	--	--	--
RW-10, RW-14, RW-16, MW-20	--	1	2	1	--	2
MW-WA-R, MW-1, MW-2, MW-8, MW-17, MW-21	--	1	1	1	--	--
MW-22	--	2	1	1	2	2
MW-23	--	2	1	1	2	--
MW-11	--	--	1	--	--	--

VOCs - Volatile organic compounds (full Target Compound List)
BTEX - Benzene, toluene, ethylbenzene, and xylenes (compounds typically found in petroleum products)
PCBs - Polychlorinated biphenyls
DRO - Diesel-range organic compounds
GRO - Gasoline-range organic compounds
MNA - Monitored natural attenuation parameters, including dissolved oxygen, oxygen-reduction potential, pH, specific conductance, turbidity, temperature, alkalinity, ferrous iron, methane, nitrate, and sulfate
SPLs - Separate-phase liquids (primarily degraded #2 fuel oil)

Note: Sampling for semivolatile organic compounds and metals was discontinued after the December 2006 quarterly monitoring event.

Due to the absence of benzene above the performance standard of 5 µg/L in monitoring wells other than MW-22, the recovery system was modified in January 2005 to convert monitoring well MW-22 to a pumping well. The responsible party also increased the sampling frequency of this well from quarterly to monthly. From 2005 through 2007, benzene was detected in monitoring well MW-22 at concentrations ranging from 6.2 µg/L to 1,000 µg/L, with the majority of results below 100 µg/L. The mean concentration of benzene from January 2006 through November 2007 was 18 µg/L. However, the yield of monitoring well MW-22 was poor, with a pumping rate of approximately 0.1 gallon per minute. The pumping rate limitations restricted the mass of benzene removed, and the well frequently ran dry.

In November 2007, EPA granted a request by the Rail Companies to cease operation of the recovery system and conduct a pilot study using in-situ chemical oxidation and aerobic bioaugmentation to attempt to expedite the achievement of the performance standard for benzene. The process required the shutdown of the recovery system. In the same month, four wells (IP-1 through IP-4) to be used as injection points for the introduction of bioremediation reagents were installed upgradient and in the vicinity of monitoring well MW-22 using air-rotary drilling techniques. The bioremediation product contains a slow-release phosphate-intercalated magnesium

peroxide reagent that delivers an oxygen source to the area of contamination to increase biodegradation rates. The product was delivered by inserting a "filter sock," a permeable fabric sleeve containing the compound, into injection wells IP-1 through IP-4. In addition, a chemical reagent consisting of a solid alkaline oxidant that employs a sodium percarbonate complex was introduced into the unsaturated soil horizon above the bedrock surface through eight temporary direct-push injection points (designated RAGP-1 through RAGP-8) in January 2008. Approximately 20 gallons of oxidant was introduced at each direct-push injection location. Benzene and #2 fuel oil are both known to respond to treatment with these oxidants. A map showing the locations of the injection wells and temporary direct-push injection locations is presented in Attachment 6.

V. Progress Since the Last Five-Year Review

The first Five-Year Review, issued on May 5, 2006, found that the remedies for both Operable Units were protective of human health and the environment in the short term, and were expected to be protective in the long term once cleanup goals outlined in the remedy were reached. No outstanding issues impacting protectiveness were identified during the first Five-Year Review. The immediate threats had been addressed and the remedy was expected to be fully protective when Site cleanup goals are achieved.

The remedy continues to remain protective at the time of this second Five-Year Review. PCB concentrations in stream sediments and benzene concentrations in ground water have continued to decline. Actions taken during the past five years include:

Non-Rail Yard Properties (OU-1)

- Discontinuation of fish population and macro-invertebrate studies in 2007 due to completion of evaluation;
- Reduction in PCB fish-tissue collection and analysis to bi-annually in every odd-numbered year since more frequent sampling was not necessary to evaluate impact;
- Increased frequency of sediment removal at certain locations in order to target the areas of highest concentrations and restrict downstream migration of PCBs;

Rail Yard Property (OU-2)

- Decrease in the number of wells monitored and analytical groups included due to downward trends or absence of contaminants over numerous consecutive sampling rounds;

- Discontinuation of domestic supply well sampling program after December 2006 sampling round due to absence of any Site-related contaminants above Federal Maximum Contaminant Levels (MCLs) during five years of sampling;

- Discontinued use of recovery and treatment system in November 2007 due to completion of fuel oil recovery and significant reduction of benzene concentrations in ground water to near performance standards;

- Initiation of pilot study to expedite progress toward reaching cleanup goals for benzene in ground water; and

- Purchase by the Rail Companies of the remaining portions of the five residential properties on which the rail tie pile was located, and subsequent incorporation into rail yard boundaries.

In addition, EPA has been contacted by the Rail Companies regarding plans for the installation of a solar center at the rail yard. The proposed solar center would be situated on the northwestern portion of the property with associated solar panels erected on the containment cell cap. According to the Rail Companies, the energy generated by the solar center would be likely used to supplement energy consumed by Amtrak as part of their normal operations. EPA has reviewed the plans and concluded that the installation of the solar panels can proceed in a manner which would not interfere with the constructed remedy. EPA was advised that construction activities associated with these plans may begin in summer 2011.

VI. Five-Year Review Process

Administrative Components

EPA notified the responsible parties and PADEP of the initiation of the Five-Year Review in the autumn of 2010. The Five-Year Review was conducted from September 2010 through May 2011. The Paoli Rail Yard Five-Year Review team was led by Christopher Sklaney, EPA's RPM for the Site, and included David Polish, EPA's Community Involvement Coordinator, and members from the regional technical and legal staff with expertise in the application of applicable or relevant and appropriate requirements (ARARs) and risk assessment. A Site-specific approach was developed for the Five-Year Review, which included:

- Community Involvement – Notifying the community that EPA is conducting a Five-Year Review at the Site and providing information on whom to contact and how to get more information about the process, and notifying the community of how to obtain a copy of the Five-Year Review Report upon completion;

- Interviews – Conducting interviews with responsible parties and local officials to determine whether these parties have any concerns regarding the Site.

- Document and Data Review – Reviewing all pertinent Site documents and environmental monitoring data. Researching ARARs cited in the ROD and subsequent modifications to the ROD, for revisions as well as identifying potentially new ARARs which may be significant to the Site circumstances. Checking available published toxicity references for Site-related contaminants to determine if there have been changes since the Site-specific risk assessment which may be relevant to the review team's evaluation of remedy protectiveness;

- Site Inspection – Visiting and inspecting the Site to visually confirm and document the conditions of the remedy, the Site, and the surrounding area; and

- Preparing the Five-Year Review Report and coordinating the review by team members and management.

EPA will continue to perform five-year reviews because the remedy implemented relies on the combination of containment and institutional controls to prevent exposure to contaminated soils, sediments and ground water that remain on-Site and which have contaminant concentrations which do not permit unrestricted use. The Site hazards are limited and well defined. Both the hazard source and the containment and treatment technologies utilized at the Site are well understood by EPA.

Community Involvement

On February 28, 2011, a notice was published in the *Daily Local News* notifying the community that EPA was conducting a Five-Year Review at the Site. The notice included a brief overview of the response actions taken at the Site, and the reason that a review is necessary. The notice listed who to contact and how to get additional information related to the Site. In addition, the notice confirmed that the review was scheduled to be completed in May 2011 and that once completed, a copy of the review report would be available at the EPA Public Reading Room at 1650 Arch Street in Philadelphia, Pennsylvania, or over the internet at http://loggerhead.epa.gov/5yr/search, then search for "Paoli Rail Yard" under PA sites.

Document Review

The Five-Year Review included a review of relevant Site documents and monitoring data, including the RI/FS, ROD, ESDs, PCOR, O&M reports, and other relevant technical reports submitted by the responsible parties.

Data Review

PCBs in Stream Sediment

Performance monitoring associated with the remedy for the non-rail yard properties includes ongoing sampling and analysis of stream sediments. Since the first Five-Year Review, overall PCB concentrations in the streams and tributaries have declined. In general, PCB concentrations in the Cedar Hollow and Hollow Road tributaries are at or near the performance standard of 1 mg/kg. The decrease in PCB concentrations observed in samples collected during sediment removals at monitoring location CHSD01 indicates the remedy is functioning as designed. Sediment removal activities at monitoring location CHSD01 have been effective at reducing concentrations in Little Valley Creek and Valley Creek. PCBs were not present above the performance standard at any sediment monitoring location in either creek during the 2009 and 2010 annual monitoring events. Minor fluctuations in PCB concentrations of 1 to 2 mg/kg have been observed at a few monitoring locations since construction was completed in 2005, a phenomenon expected as part of the remedy design.

PCB concentrations at monitoring location CHFP16, located approximately 1,500 feet from the uppermost portion of the Cedar Hollow tributary, were as high as 4.7 mg/kg during the 2009 annual monitoring event, and as high as 10 mg/kg during the 2010 annual monitoring event. Since sediment removal was conducted after the 2009 annual monitoring event, the elevated concentrations of PCBs observed at monitoring location CHFP16 during the 2010 annual monitoring event suggests that an upgradient source may be present. A summary of site-wide PCB analytical results and sediment removal volumes at monitoring location CHSD01 is presented on the map in Attachment 3.

PCBs in Ground Water

Analytical results of samples collected from monitoring wells located around the containment cell and asphalt cover area indicate that PCBs are most likely not being released or migrating. PCBs were infrequently identified in ground water samples collected during this second Five-Year Review period in the containment cell monitoring wells, but never identified in consecutive monitoring periods. The PCB Aroclor-1248 was identified in November 2007 in monitoring well MW-CC-1 at a concentration of 0.9 µg/L, and in monitoring well MW-CC-2 at a concentration of 3.8 µg/L. The PCB Aroclor-1260 was identified in December 2010 near the former car shop in monitoring well MW-22 at a concentration of 19 µg/L. No performance standards were established in the remedy for PCBs in ground water, and no positive results in consecutive monitoring events have been identified to date. As outlined in the remedy, the occurrence of positive PCB results in two consecutive monitoring periods may permit EPA to take additional actions. A map identifying monitoring well locations and tables outlining analytical results for PCBs in ground water samples collected from containment cell monitoring wells are included in Attachment 4. The location of monitoring well MW-22 is presented on the map included in Attachment 5.

Benzene in Ground Water

Despite minor fluctuations, benzene concentrations have trended downward and are currently near and regularly below the performance standard of 5 µg/L, with results above the performance standard occurring only in monitoring well MW-22. For 11 consecutive quarters from December 2007 through January 2010, benzene was reported below the performance standard in monitoring well MW-22. In the twelfth quarter after the chemical and bioaugmentation reagents were introduced, benzene was reported in monitoring well MW-22 at 9.2 µg/L (April 2010) and in a confirmation sample collected in June 2010 at 11 µg/L. In the two subsequent quarters, August and December 2010, benzene was again reported below performance standards. As outlined in manufacturer guidelines, slow-release bioaugmentation reagents introduced via filter socks are typically useful for up to 12 months per application. Reagent filter socks were most recently replaced in July and August 2010. Analytical results for all monitoring wells associated with the asphalt cover area, including a map identifying well locations, is presented in Attachment 5.

Though not specifically required as part of performance monitoring, samples have been collected from the four injection wells (IP-1 through IP-4) installed as part of the pilot study since February 2008. With the exception of injection well IP-4, benzene results in all the wells were below the performance standard; however, since the injection wells were installed with the sole purpose of delivering bioaugmentation products to the source, EPA does not consider these wells subject to the performance standard outlined in the remedy. Analytical results for quarterly sampling in monitoring well MW-22 and the injection wells are included in Attachment 6, along with a figure showing the locations of the injection wells and temporary injection points around monitoring well MW-22. A table summarizing monthly benzene analytical results from 2005 through 2007 is also included in Attachment 6.

Overview

Analytical results and monitoring suggests that the remedy for both Operable Units appears to be functioning as designed. PCBs stabilized and encapsulated within the containment cell do not appear to be migrating. Cleanup at residential properties has been completed. The concentration of PCBs in stream sediments has declined since the first Five-Year Review, although the locations where PCBs occur above the performance standard continue to vary. PCB concentrations at one monitoring location, CHFP16, have been as high as 10 mg/kg during the last two annual stream sediment monitoring events. The initiative taken by the responsible party to increase the sediment removal frequency was done in part to address contaminant movement which can occur during storm events. Benzene concentrations in ground water have declined since the last review. Although not a component of the selected remedy, the application of in-situ chemical oxidation and bioaugmentation reagents as part of the pilot study has assisted in the reduction of benzene concentrations in ground water.

Site Inspection

Two site visits were conducted during this review to observe site conditions and to inspect the various components of the remedy. During the site visits, the remedy was discussed in detail with the responsible parties.

On December 1, 2010, an inspection of the rail yard remedy was conducted. Persons present for the Site inspection included: Jack Schweitzer of Amtrak; Paul Stratman of AGC, Resident Engineer for the project on behalf of the Rail Companies; Kelley Chase, the previous EPA RPM; and Christopher Sklaney, the current EPA RPM. The inspection team toured the containment cell and observed the cap is in good condition and is well vegetated. The asphalt cap, retaining walls, and various surface water controls were also found to be in good condition. The property is completely fenced with chain-link fencing, which was in good condition. The recovery system was not operational due to the active in-situ chemical oxidation pilot study being conducted in the area of monitoring well MW-22. Overall the remedy was found to be functioning as designed. Several minor items were noted for repair as part of the inspection. The necessary remedial action completion reports, O&M manuals and health and safety plans are available on-site.

An inspection of the stream portion of the non-rail yard remedy was conducted in parts on December 2 and 6, 2010. Persons present for the Site inspection included: APU's legal representative from Donovan Law, M.J. Donovan; Francisco Trejo of UMC, President present on behalf of APU; Michael O'Connor of APU, Project Coordinator; and Christopher Sklaney, EPA RPM. The various components of the stream remedy were found to be in good condition. Minor items requiring maintenance were noted. These included: removal of the remaining silt fencing installed during construction activities; removal of a fallen tree in the vicinity of the sediment collection area; replacement of plantings and coir logs along certain stream bank areas; and repair of the berm in the wetland improvement area. None of the items noted, affect the protectiveness of the remedy. All residential properties which were previously inspected on May 24, 2005 as part of the final inspection of the non-rail yard areas were found to be in good condition. All areas had been fully restored and any previously distressed plantings had been replaced and were found to be in good condition. No further maintenance is planned for the residential properties.

Interviews

By way of telephone calls, electronic mail, and personal correspondence, EPA informed the Rail Companies, APU, Tredyffrin and Willistown Township, and PADEP of the upcoming conduct of the second Five-Year Review. Representatives of Tredyffrin Township inquired about the current status of the remedy at the rail yard. Township officials did not express any concerns regarding the Site or the Five-Year Review. No other issues were identified during the correspondence.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision document?

The assessment of the second Five-Year Review found that the remedy is functioning as intended by the ROD, as modified by the ESDs. Structures and systems constructed as part of the remedy are in place and regularly maintained. The immediate threats were addressed prior to the first Five-Year Review, and the remedial measures taken continue to be protective of human health and the environment. Performance standards for PCB-contaminated soils have been achieved on the rail yard property and at residential properties where soil excavations were conducted. The vast majority of PCB-contaminated sediments have been removed from the stream areas impacted by the migration of PCBs from the rail yard. Except for one sediment monitoring location in the Cedar Hollow tributary (CHFP16), the concentration trends in stream sediments have continued to decline, and areas containing PCBs above the performance standard have been reduced significantly. PCB concentrations at monitoring location CHFP16 were as high as 4.7 mg/kg during the 2009 annual monitoring event, and as high as 10 mg/kg during the 2010 annual monitoring event. Since sediment removal was conducted after the 2009 event, the elevated concentrations of PCBs observed at monitoring location CHFP16 during the 2010 event suggests that an upgradient source may be present.

Benzene concentrations in ground water are near and often below the performance standard as reported during quarterly monitoring, but have not consistently reached cleanup goals. Concentration trends have continued to decline since the first Five-Year Review. In-situ chemical oxidation and aerobic bioaugmentation has been used as part of a pilot study to further reduce benzene concentrations with the goal of reaching performance standards in the near future. The asphalt cap, which prevents direct contact with rail yard soils contaminated with fuel oil and PCBs and restricts infiltration of ground water locally, is in good condition and regularly maintained. The recovery and treatment system constructed as part of the remedy has effectively removed fuel oil from ground water at the rail yard and reduced the extent of benzene-contaminated ground water. The effective implementation of institutional controls has prevented exposure to and ingestion of contaminated ground water. Regular monitoring and sampling of both rail yard and non-rail yard properties occurs as part of O&M activities.

The institutional controls implemented and enforced pursuant to the Consent Decree prohibit use of the rail yard property for residential or agricultural purposes, and prohibit the use of ground water at the rail yard for domestic purposes. The controls apply only to the rail yard property and are intended to protect the remedy without preventing re-use of the property in a manner that is compatible with the remedy. No evidence was observed during the inspections that suggests the institutional controls have been violated. The rail yard property is currently devoted to implementation of the remedy, and ground water is not used for any purpose.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

Exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection are still valid.

Changes in Standards and To Be Considereds (TBCs)

As part of this Five-Year Review, EPA reviewed the ARARs for the Site to determine if any significant changes in regulations, promulgated standards, or those "to be considered" (TBC) such as criteria and guidance had occurred, and if so, whether the changes impact the selected performance standards or protectiveness of the remedy. A comprehensive list of those ARARs identified for the Site is included in the remedy documents. In the review, EPA did not identify any changes in regulations, standards, or TBCs that would call into question the protectiveness of the remedy.

The ground water performance standards for benzene were derived in accordance with the requirement that remedial actions "at least" attain ARARs, including MCLs, and be protective of human health and the environment. The ground water performance standard for benzene meets the current federal and Pennsylvania state cleanup goal or MCL.

Soil and sediment performance standards for the Site remain consistent with EPA cleanup recommendations for PCBs in soil at Superfund sites and are considered to be protective of human health and the environment, as outlined in EPA Directive 9355.4-01, *A Guide on Remedial Actions at Superfund Sites with PCB Contamination* (August 1990).

Vapor intrusion is a potential source of exposure to human health that EPA has recently begun to explore at all sites with VOC contamination in ground water. VOC contamination of ground water at the Site, specifically the rail yard property, is limited to benzene. Monitoring of on-site monitoring wells indicates that benzene is only present in one well and currently at levels below or near the performance standard of 5 µg/L. Based on the low levels and limited areal extent of benzene in ground water and current site usage, a vapor intrusion investigation is not warranted at this time.

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

The exposure assumptions used to develop the Human Health Risk Assessment included both current exposures and potential future exposures. No workers are currently present at the rail yard property, and no evidence of trespassing was observed during the Five-Year Review site inspection or during regular quarterly inspections conducted as part of O&M activities. No changes in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment have been implemented. These assumptions were considered to be conservative and reasonable in evaluating risk and developing risk-based cleanup levels. No change to these assumptions or the cleanup levels is warranted. No change to the standardized risk assessment methodology that could affect the protectiveness of the remedy has occurred.

Question C: Has any other information come to light that calls into question the protectiveness of the remedy?

No new information exists that would compromise the protectiveness of the remedy. Land use and conditions on both the rail yard and non-rail yard properties has not changed since the first Five-Year Review.

Technical Assessment Summary

The review of Site-related documents, risk assumptions, and results of the O&M reports and Site inspection indicates that the constructed remedy is functioning as intended. Cleanup goals for PCBs in rail yard and residential soils have been reached, and as a consequence of remedial actions being conducted as part of O&M activities, concentrations and trends of PCBs in sediment and benzene in ground water continue to decline except for one sediment monitoring location (CHFP16 in the Cedar Hollow tributary). Sampling of local private domestic water supply wells was discontinued after five years of analytical results indicated that no contaminants were present above MCLs or performance standards. Use of the recovery and treatment system was discontinued since fuel oil is no longer present. The Rail Companies are conducting an ongoing pilot study using in-situ chemical oxidation with the intent of expediting the achievement of ground water performance standards. O&M activities continue on a regular basis for both Operable Units. No changes in Site conditions or promulgated standards that would affect RAOs or the overall protectiveness of the remedy have occurred.

VIII. Issues

PCB concentrations at one stream monitoring location in the Cedar Hollow tributary, CHFP16, were above the performance standard during the last two annual monitoring events. Concentrations at monitoring location CHFP16 were as high as 4.7 mg/kg in 2009, and as high as 10 mg/kg in 2010. Since sediment removal was conducted after the 2009 event, the elevated concentrations of PCBs observed at monitoring location CHFP16 during the 2010 event suggests that an upgradient source may be present. The issue is identified in Table 4.

Table 4. Five-Year Review Issues

Issue	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Elevated PCB concentrations at sediment monitoring location CHFP16	N	N

IX. Recommendations and Follow-Up Actions

Table 5. Five-Year Review Recommendations and Follow-Up Actions

Recommendation/ Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
				Current	Future
Evaluate the analytical results of the next annual sediment monitoring event, scheduled for autumn 2011. If the results are elevated, take steps to identify the source of PCB contamination at sediment monitoring location CHFP16.	PRP	EPA	09/30/2012	N	N

X. Protectiveness Statement

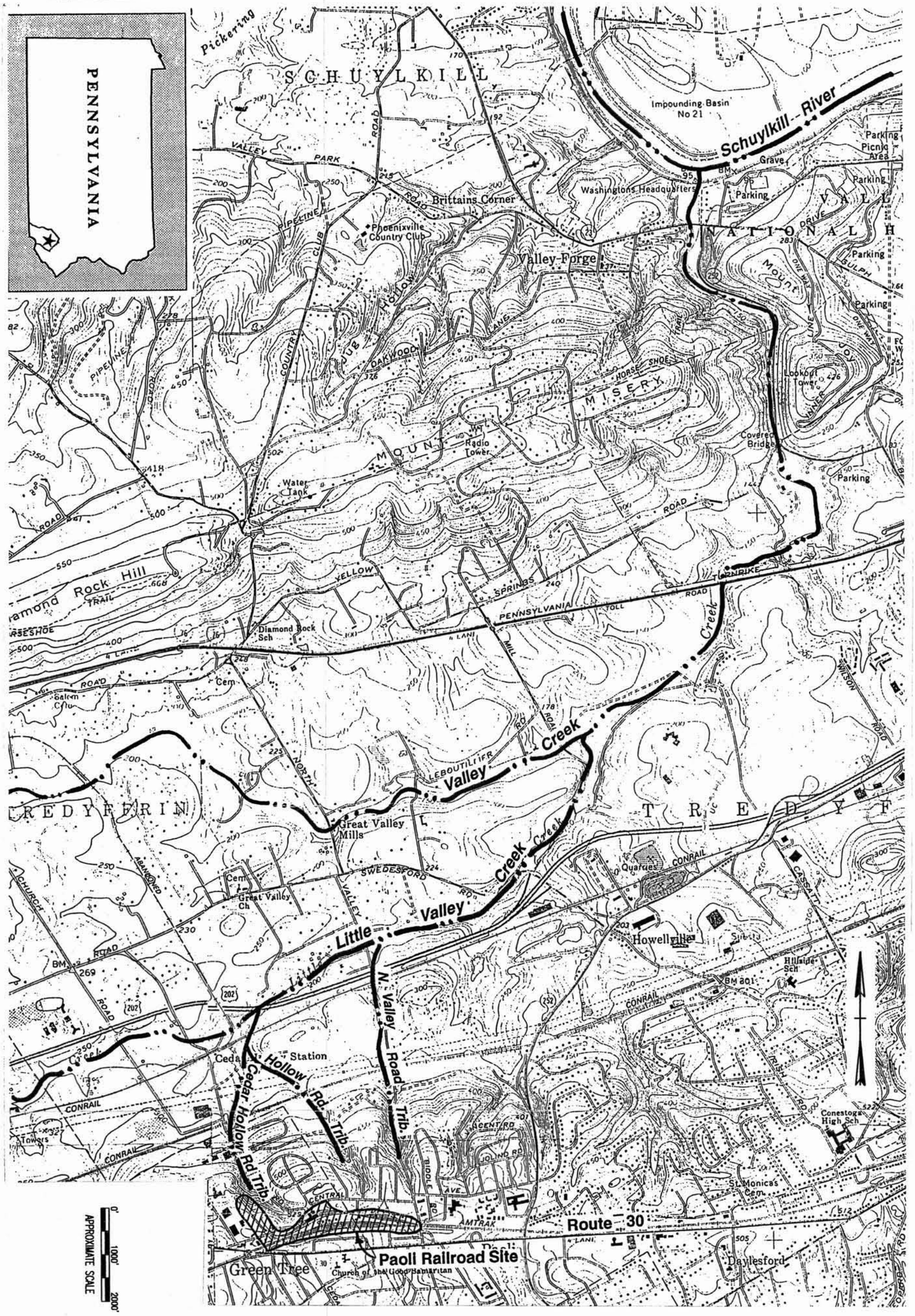
The remedy is protective of human health and the environment. Monitoring data indicate that the remedy is functioning as intended. Cleanup goals have been achieved on the rail yard property and at residential properties. The majority of PCB-contaminated sediments have been removed from impacted stream areas, and ongoing sediment removal activities continue to restrict the migration of PCBs. In the past two years, elevated PCB concentrations have been consistently observed at sediment monitoring location CHFP16. If the results from the autumn 2011 annual monitoring event are elevated at this location, steps will be taken to identify the source of the contamination. Engineering controls constructed as part of the remedy, including the containment cell, storm water management system, asphalt cover, retaining walls, and security fencing, are operating as designed and prevent direct contact with contaminated soils that remain at the rail yard property. The recovery and treatment system has effectively removed fuel oil, reduced benzene concentrations, and prevented the off-site migration of contaminated ground water. Benzene concentrations have been further reduced through in-situ chemical oxidation and aerobic bioremediation conducted as part of an on-going pilot study. All institutional controls are in place and functioning as anticipated.

XI. Next Review

The third Five-Year Review for the Paoli Rail Yard site is required no later than five years from the signature date of this Five-Year Review.

Attachment 1

Site Location Map



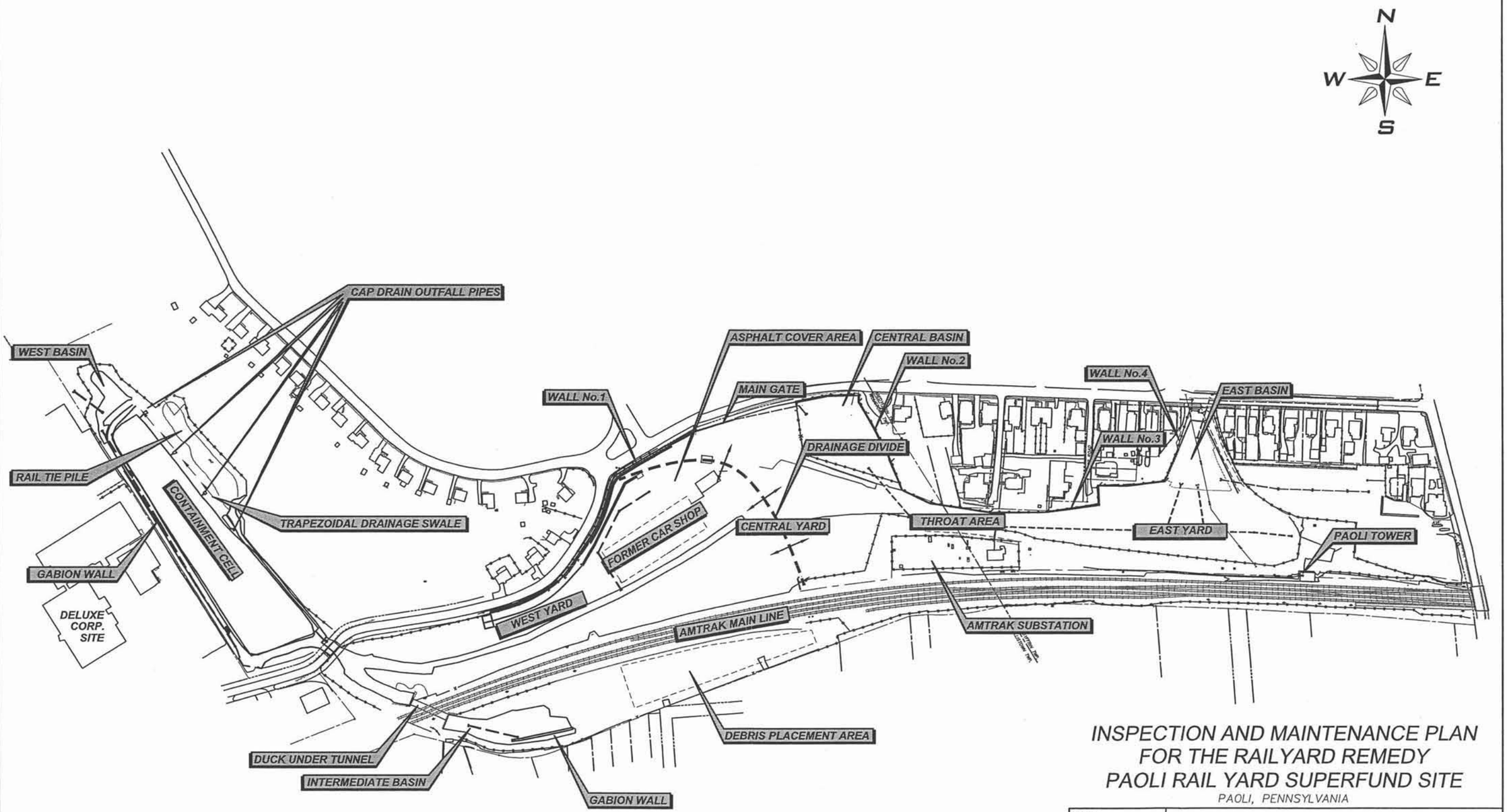
Unicorn Management Consultants, LLC 52 FEDERAL ROAD DANBURY, CT (203) 205-9000	*PROJECT*	PAOLI RAIL YARD PAOLI, PENNSYLVANIA
	DRAWING	LOCATION MAP

REVISION NO.	NO.	DATE

PROJECT NO.: 2044-200
FILE NAME: 2044200A
SCALE: SEE BAR
DATE: 8/20/98
BY: AD
CK:
FIGURE: 1-1

Attachment 2

Rail Yard Property Site Plan



INSPECTION AND MAINTENANCE PLAN FOR THE RAILYARD REMEDY PAOLI RAIL YARD SUPERFUND SITE

PAOLI, PENNSYLVANIA

LEGEND

DRAINAGE DIVIDE BETWEEN EAST AND WEST STORM WATER MANAGEMENT SYSTEMS

270 0 270 540

SCALE IN FEET

Scale: 1"=270'	KEY SITE FEATURES
Originated By: T.D.T.	
Drawn By: P.S.G.	
Checked By: T.D.T.	
Project Mgr: P.G.S.	
Dwg No. 2005-1464-02-001	
Issued: JAN 25 2011	Project No. 2005-1464-02

Advanced GeoServices Corp.
1055 Andrew Drive Suite A
West Chester, Pennsylvania 19380
(610) 840-9100
FAX: (610) 840-9199

FIGURE: 1

J:\Paoli Rail Yard\DRAWINGS\2005-1464-02\2005-1464-02-001.dwg

Attachment 3

Stream Sediment Sampling Map and PCB Analytical Results Summary

Note: All sample values are in mg/kg, (parts per million/ppm).
For samples shown as 0-3":
In 2005 and 2006, were taken from 0-1" depth interval.
In 2007 and 2008, were taken from 0-3".
All values for CHSD01sediment removal amounts are approximate.

CHSD01(Vacuum Events)	Removed	Concentration Range
September 2004	~17 cu. yds	0.42 - 7.85
September 2004	~15.7 cu. yds	0.34 - 3.97
December 2004	~18 cu. yds	0.52 - 2.83
May 2005	~18 cu. yds	0.22 - 2.43
September 2005	~15 cu. yds	0.30 - 2.67
May 2006	~15 cu. yds	0.23 - 4.55
November 2006	~15 cu. yds	0.56 - 3.25
May 2007	~19 cu. yds	0.25 - 0.72
October 2007	~22 cu. yds	0.55 - 2.54
June 2008	~8 cu. yds	0.17 - 1.00
December 2008	~20 cu. yds	0.33 - 0.64
May 2009	~13 cu. yds	0.22 - 3.22
September 2009	~ 8.6 cu. yds	0.31 - 1.09
April 2010	~ 12.7 cu. yds	0.29 - 1.20
July 2010	~ 12.3 cu. yds	0.14 - 0.92
September 2010	~ 3.6 cu. yds	0.56 - 1.00
December 2010	~ 6.6 cu. yds	0.20 - 1.50

CHFP02	0-6"	6-12"	12-24"
2001	3.49	5.40	10.70
	0-3"	4-6"	
2005	1.14		
2006	0.99		
2007	1.13	0.53	
2008	1.50	0.23	
2009	1.80	0.78	
2010	0.31	0.38	

LVSD12	0-6"	6-12"
2001	0.37	0.34
2009	2.10	9.50
2010	0.19	0.20

LVSD11	0-6"	6-12"	12-24"
2001	1.70	1.90	2.05
	0-3"	6-8"	12-13"
2005	0.99		2.33
2006	0.77		0.66
2007	0.17	0.12	
2008	0.60	0.27	
	0-6"	6-12"	12-24"
2009	0.16	0.45	0.63
2010	0.25	0.18	0.25

VCSD09	0-6"	6-12"	12-24"
2001	0.47	0.67	0.40
2009	0.29	0.31	0.23
2010	0.13 L	0.24 J	0.35

VCSD08	0-6"	6-12"
2001	0.03	0.06
	0-3"	6-8" 12-13"
2005	0.02	0.01
2006	0.02	0.03
2007	0.03	0.02
2008	0.05	0.03
2009	0.09	0.05
2010	0.02 J	0.02 J
Post-2010	0.10	0.14

CHSD02	0-6"	6-12"	12-24"
2001	0.73	0.39	0.12
2009	2.50	0.76	
2010	0.48	0.82	

LVFP11	0-6"	6-12"	12-24"
2001	5.95	5.05	3.55
	0-3"	12-13"	
2005	0.50	0.10	
2006	0.40	0.27	
2007	0.18	0.09	
2008	0.03	0.01	
	0-6"	6-12"	12-24"
2009	0.18	0.13	0.12
2010	0.03	0.02	0.01

LVSD06	0-6"	6-12"
2001	0.12	0.10
	0-3"	6-8" 12-13"
2005	0.18	0.21
2006	0.18	0.07
2007	0.24	0.69 0.25
2008	0.10	0.14 0.18
2009	0.12	0.09 0.05
2010	0.04	0.08 0.03 J

CHFP05	0-6"	6-12"	12-24"
2001	2.46	2.66	1.23
	0-3"	6-8"	
2005	0.79		
2006	0.96		
2007	0.39	0.48	
2008	0.60	0.86	
2009	1.10	0.62	
2010	0.84	1.90	

CHSD03	0-3"
2001	1.53
2005	0.78
2006	1.53
2007	1.83
2008	0.87
2009	0.26
2010	0.80

HRSD01	0-6"	6-12"	12-24"
2001	0.60	0.32	0.37
2009	6.68		
2010	0.97		

HRFP04	0-6"	6-12"	12-24"
2001	3.35	3.85	6.56
	0-3"		
2005	3.76		
2006	0.72		
2007	2.36		
2008	0.48		
2009	0.27		
2010	0.13		

CHSD04	0-6"	6-12"
2001	0.99	0.58
2009	0.19	0.51
2010	0.43	0.55

CHFP09	0-6"	6-12"
2001	7.94	4.65
	0-3"	
2005	1.43	
2006	1.13	
2007	0.35	
2008	0.12	
2009	0.66	
2010	1.20	

CHFP06	0-6"	6-12"	12-24"
2001	2.27	2.48	3.45
2009	20.00	0.60	0.60
2010	0.23	0.29 J	

HRFP14	0-6"	6-12"
2001	5.27	4.38
2009	1.70	0.57
2010	0.44	0.86

CHFP10	0-6"	6-12"	12-24"
2001	1.76	0.63	1.53
	0-3"	6-8"	
2005	0.94		
2006	1.02		
2007	0.97	1.12	
2008	1.50	0.93	
2009	0.67	0.59	
2010	1.20	0.44	

CHFP15	0-6"	6-12"
2001	3.14	1.02
2009	0.63	0.65
2010	0.71	0.89

HRFP08	0-6"
2001	4.75
2009	1.80
2010	0.88

CHFP16	0-6"	6-12"	12-18"	18-24"
2001	1.33	6.57	0.04	0.01
2009	2.40	4.70		
2010	10.00	5.20		

CHCS01	0-1"
2001	4.26
	0-3"
2005	1.01
2006	2.85
2007	0.43
2008	0.01
2009	2.21
2010	2.70
Post-2010	1.17

HRFP15	0-6"	6-12"
2001	5.27	0.71
2009	1.10	2.00
2010	1.80	1.10

HRFP12	0-6"	6-12"
2001	7.45	4.43
	0-3"	
2005	1.19	
2006	1.36	
2007	0.75	
2008	1.00	
2009	0.39	
2010	1.80	

HRSD02	0-6"	6-12"	12-18"
2001	2.55	3.87	4.74
	0-3"		
2005	0.72		
2006	1.05		
2007	1.44		
2008	0.57		
2009	1.50		
2010	0.92		

HRCS01	0-3"
2001	0.69
2005	1.61
2006	0.58
2007	0.38
2008	2.30
2009	0.65
2010	0.42
Post-2010	0.59

CHFP11	0-6"	6-12"	12-24"
2001	2.16	0.02	0.01
	0-3"	6-8"	
2005	2.28		
2006	0.90		
2007	1.13	1.73	
2008	1.50	1.10	
2009	0.71	0.84	
2010	1.30	0.74	

CHFP14	0-6"	6-12"
2001	4.07	3.25
	0-3"	4-6"
2005	4.23	
2006	0.30	
2007	1.07	1.37
2008	0.63	0.30
2009	3.00	1.30
2010	2.80	1.90

HRFP21	0-6"	6-12"	12-24"
2001	5.69	3.88	1.04
2009	2.40	1.00	
2010	0.52	0.52	

Valley Creek
Little Valley Creek
East Branch Crum Creek
Darby Creek
Waynesboro

Annual Sampling Summary 2005-2010

3,900 1,950 0 3,900 7,800 Feet

Data Qualifiers:

L - The reported value may be biased low.

J - Indicates an estimated value

Unicorn Management Consultants, LLC

52 Federal Road
Suite 2C
Danbury, CT
06810

(203) 205 9000

Project Name: Paoli Railyard Superfund Site

Figure 4-1

Author: AMT

Checked By:

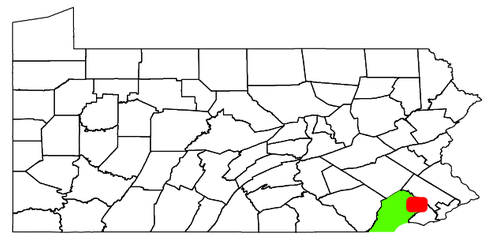
Project #: 2000

Created: 9/22/08

Revised: 01/19/10

Scale: 1 in:3,333 ft

File: FiveYearSampleSummary.mxd



Pennsylvania

Legend

Roads

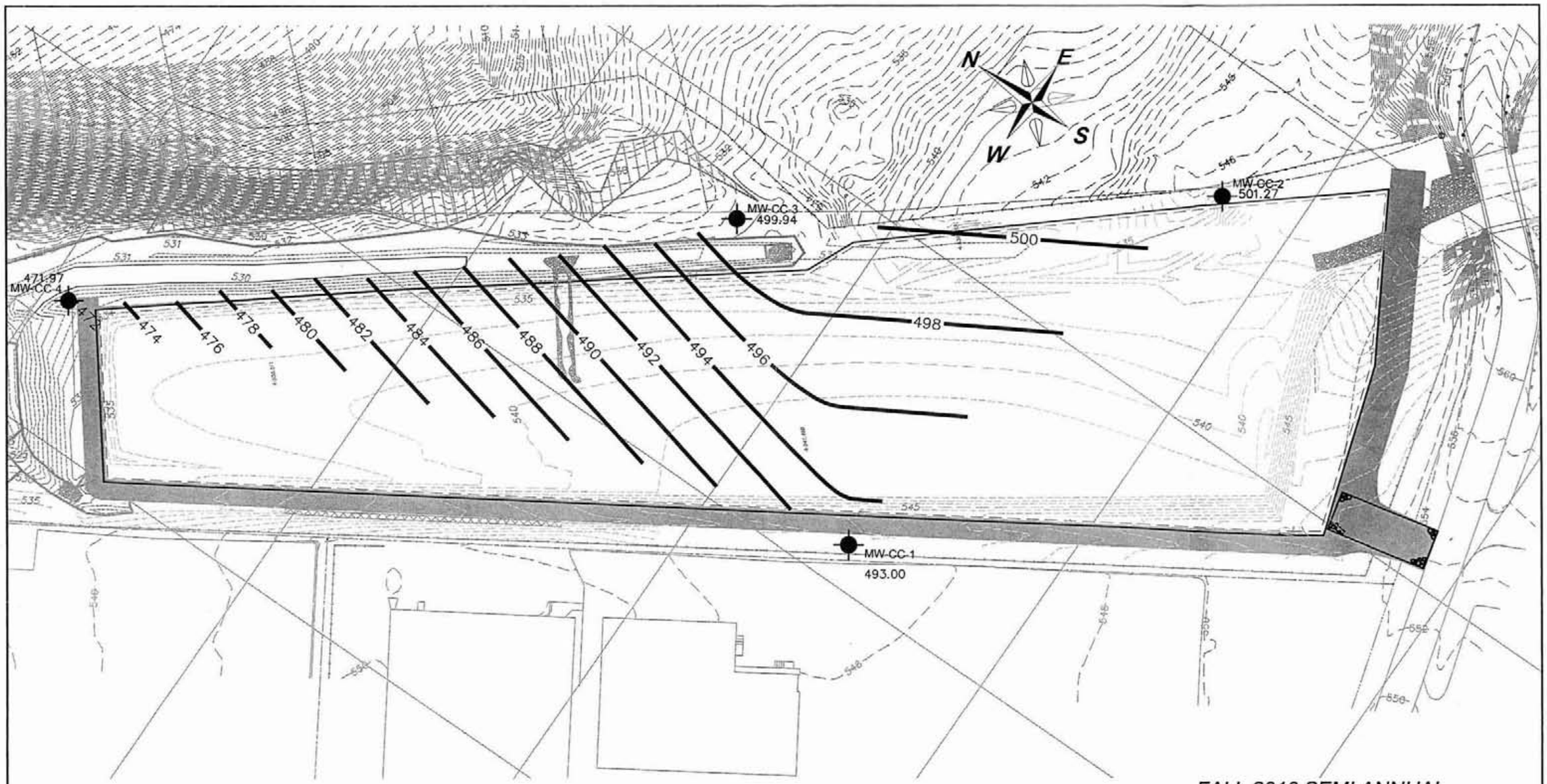
- Interstate
- State Route
- **Waterbodies**
- **Paoli Railyard Property**
- **Railroads**
- Annual Sample Locations
- 5th Year Additional Locations

SAMPLE ID	Depth Interval(s)
Sample Date	Red = Above 1.00ppm
Sample Date	Green = Less Than or Equal 1.00ppm

2001 Data = Pre-remediation

Attachment 4

Containment Cell Monitor Well Location Map and Analytical Results Summary for PCBs in Ground Water



FALL 2010 SEMI ANNUAL INSPECTION REPORT PAOLI RAIL YARD SUPERFUND SITE

PAOLI, PENNSYLVANIA

LEGEND

MW-CC-1 – EXISTING MONITORING WELL LOCATION

– WATER LEVEL ELEVATION CONTOUR

0 15 30 60
SCALE: FEET

Scale: 1"=60'	CONTAINMENT CELL GROUNDWATER ELEVATION CONTOURS DECEMBER 13, 2010
Originated By: M.J.P.	
Drawn By: C.E.P.	
Checked By: P.G.S.	
Project Mgr: P.G.S.	
Dwg No. 2005-1464-14-31	
JAN 25 2011	Project No. 2005-1464-14 / FIGURE: 4

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J:\Paoli Rail Yard\DRAWINGS\2005-1464-14\2005-1464-14-40.dwg

SUMMARY OF CONTAINMENT CELL POLYCHLORINATED BIPHENYL RESULTS
SW-846 ANALYSES
Paoli Rail Yard Superfund Site
Paoli, Pennsylvania

Sample Location		MW-CC-1			MW-CC-1			MW-CC-1			MW-CC-1			MW-CC-1			MW-CC-1			MW-CC-1		
Lab ID		652285			676171			700173			724125			764396			796017			806637		
Sample Date		7/12/2005			10/6/2005			1/5/2006			4/5/2006			8/22/2006			12/21/2006			2/8/2007		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater		
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Polychlorinated Biphenyls																						
Aroclor-1016	µg/L		U	0.51		U	0.5		U	0.5		U	0.5		U	0.5		U	0.53		U	0.5
Aroclor-1221	µg/L		U	0.51		U	0.5		U	0.5		U	0.5		U	0.5		U	0.53		U	0.5
Aroclor-1232	µg/L		U	0.51		U	0.5		U	0.5		U	0.5		U	0.5		U	0.53		U	0.5
Aroclor-1242	µg/L		U	0.51		U	0.5		U	0.5		U	0.5		U	0.5		U	0.53		U	0.5
Aroclor-1248	µg/L		U	0.51		U	0.5		U	0.5		U	0.5		U	0.5		U	0.53		U	0.5
Aroclor-1254	µg/L		U	0.51		U	0.5	3.4		0.5		U	0.5		U	0.5		U	0.53		U	0.5
Aroclor-1260	µg/L		U	0.51		U	0.5	6.4		0.5		U	0.5		U	0.5		U	0.53		U	0.5
Aroclor-1262	µg/L		U	0.51		U	0.5		U	0.5		U	0.5		U	0.5		U	0.53		U	0.5
Aroclor-1268	µg/L		U	0.51		U	0.5		U	0.5		U	0.5		U	0.5		U	0.53		U	0.5

Sample Location		MW-CC-1			MW-CC-1			MW-CC-1			MW-CC-1			MW-CC-1			MW-CC-1			MW-CC-1		
Lab ID		819998			846800			881264			894382			939365			966597			997820		
Sample Date		4/4/2007			7/18/2007			11/29/2007			1/23/2008			7/29/2008			11/11/2008			4/21/2009		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater		
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Polychlorinated Biphenyls																						
Aroclor-1016	µg/L		U	0.5		U	0.5		U	0.5		U	0.53		U	0.51		U	0.5		U	0.5
Aroclor-1221	µg/L		U	0.5		U	0.5		U	0.5		U	0.53		U	0.51		U	0.5		U	0.5
Aroclor-1232	µg/L		U	0.5		U	0.5		U	0.5		U	0.53		U	0.51		U	0.5		U	0.5
Aroclor-1242	µg/L		U	0.5		U	0.5		U	0.5		U	0.53		U	0.51		U	0.5		U	0.5
Aroclor-1248	µg/L		U	0.5		U	0.5	0.9		0.5		U	0.53		U	0.51		U	0.5		U	0.5
Aroclor-1254	µg/L		U	0.5		U	0.5		U	0.5		U	0.53		U	0.51		U	0.5		U	0.5
Aroclor-1260	µg/L		U	0.5		U	0.5		U	0.5		U	0.53		U	0.51		U	0.5		U	0.5
Aroclor-1262	µg/L		U	0.5		U	0.5		U	0.5		U	0.53		U	0.51		U	0.5		U	0.5
Aroclor-1268	µg/L		U	0.5		U	0.5		U	0.5		U	0.53		U	0.51		U	0.5		U	0.5

Sample Location		MW-CC-1			MW-CC-1			MW-CC-1		
Lab ID		8154-4			12503-1			21350-1		
Sample Date		11/19/2009			4/21/2010			12/17/2010		
Matrix		Groundwater			Groundwater			Groundwater		
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Polychlorinated Biphenyls										
Aroclor-1016	µg/L		U	0.52		U	0.53		U	0.5
Aroclor-1221	µg/L		U	0.52		U	0.53		U	0.5
Aroclor-1232	µg/L		U	0.52		U	0.53		U	0.5
Aroclor-1242	µg/L		U	0.52		U	0.53		U	0.5
Aroclor-1248	µg/L		U	0.52		U	0.53		U	0.5
Aroclor-1254	µg/L		U	0.52		U	0.53		U	0.5
Aroclor-1260	µg/L		U	0.52		U	0.53		U	0.5
Aroclor-1262	µg/L		U	0.52		U	0.53		U	0.5
Aroclor-1268	µg/L		U	0.52		U	0.53		U	0.5

Q - qualifier, RL - reporting limit, J - estimated, U - not detected, UJ - estimated reporting limit, NA - not analyzed

SUMMARY OF CONTAINMENT CELL POLYCHLORINATED BIPHENYL RESULTS
SW-846 ANALYSES
Paoli Rail Yard Superfund Site
Paoli, Pennsylvania

Sample Location		MW-CC-2			MW-CC-2			MW-CC-2			MW-CC-2			MW-CC-2			MW-CC-2			MW-CC-2		
Lab ID		652286			676172			700174			724126			764397			796018			806638		
Sample Date		7/12/2005			10/6/2005			1/5/2006			4/5/2006			8/22/2006			12/21/06			2/8/2007		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater		
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Polychlorinated Biphenyls																						
Aroclor-1016	µg/L		U	0.5		UL	0.5		U	0.5		U	0.5		U	0.5		U	0.51		U	0.5
Aroclor-1221	µg/L		U	0.5		UL	0.5		U	0.5		U	0.5		U	0.5		U	0.51		U	0.5
Aroclor-1232	µg/L		U	0.5		UL	0.5		U	0.5		U	0.5		U	0.5		U	0.51		U	0.5
Aroclor-1242	µg/L		U	0.5		UL	0.5		U	0.5		U	0.5		U	0.5		U	0.51		U	0.5
Aroclor-1248	µg/L		U	0.5		UL	0.5		U	0.5		U	0.5		U	0.5		U	0.51		U	0.5
Aroclor-1254	µg/L		U	0.5		UL	0.5		U	0.5		U	0.5		U	0.5		U	0.51		U	0.5
Aroclor-1260	µg/L		U	0.5		UL	0.5		U	0.5		U	0.5		U	0.5		U	0.51		U	0.5
Aroclor-1262	µg/L		U	0.5		UL	0.5		U	0.5		U	0.5		U	0.5		U	0.51		U	0.5
Aroclor-1268	µg/L		U	0.5		UL	0.5		U	0.5		U	0.5		U	0.5		U	0.51		U	0.5

Sample Location		MW-CC-2			MW-CC-2			MW-CC-2			MW-CC-2			MW-CC-2			MW-CC-2			MW-CC-2		
Lab ID		819999			846801			881262			894383			939366			966598			997821		
Sample Date		4/4/2007			7/18/2007			11/29/2007			1/23/2008			7/29/2008			11/11/2008			4/21/2009		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater		
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Polychlorinated Biphenyls																						
Aroclor-1016	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.51		U	0.5		U	0.5
Aroclor-1221	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.51		U	0.5		U	0.5
Aroclor-1232	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.51		U	0.5		U	0.5
Aroclor-1242	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.51		U	0.5		U	0.5
Aroclor-1248	µg/L		U	0.5		U	0.5	3.8		0.5		U	0.5		U	0.51		U	0.5		U	0.5
Aroclor-1254	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.51		U	0.5		U	0.5
Aroclor-1260	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.51		U	0.5		U	0.5
Aroclor-1262	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.51		U	0.5		U	0.5
Aroclor-1268	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.51		U	0.5		U	0.5

Sample Location		MW-CC-2			MW-CC-2			MW-CC-2		
Lab ID		8154-1			12503-2			21350-2		
Sample Date		11/18/2009			4/21/2010			12/17/2010		
Matrix		Groundwater			Groundwater			Groundwater		
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Polychlorinated Biphenyls										
Aroclor-1016	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1221	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1232	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1242	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1248	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1254	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1260	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1262	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1268	µg/L		U	0.51		U	0.51		U	0.5

Q - qualifier, RL - reporting limit, J - estimated, U - not detected, UJ - estimated reporting limit, NA - not analyzed

SUMMARY OF CONTAINMENT CELL POLYCHLORINATED BIPHENYL RESULTS
SW-846 ANALYSES
Paoli Rail Yard Superfund Site
Paoli, Pennsylvania

Sample Location		MW-CC-3			MW-CC-3			MW-CC-3			MW-CC-3			MW-CC-3			MW-CC-3			MW-CC-3		
Lab ID		652287			676173			700175			724127			764398			796019			806640		
Sample Date		7/12/2005			10/7/2005			1/5/2006			4/5/2006			8/22/2006			12/21/2006			2/8/2007		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater		
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Polychlorinated Biphenyls																						
Aroclor-1016	µg/L		U	0.5		UL	0.5		U	0.5		U	0.5		U	0.51		U	0.56		U	0.5
Aroclor-1221	µg/L		U	0.5		UL	0.5		U	0.5		U	0.5		U	0.51		U	0.56		U	0.5
Aroclor-1232	µg/L		U	0.5		UL	0.5		U	0.5		U	0.5		U	0.51		U	0.56		U	0.5
Aroclor-1242	µg/L		U	0.5		UL	0.5		U	0.5		U	0.5		U	0.51		U	0.56		U	0.5
Aroclor-1248	µg/L		U	0.5		UL	0.5		U	0.5		U	0.5		U	0.51		U	0.56		U	0.5
Aroclor-1254	µg/L		U	0.5		UL	0.5		U	0.5		U	0.5		U	0.51		U	0.56		U	0.5
Aroclor-1260	µg/L		U	0.5		UL	0.5		U	0.5		U	0.5		U	0.51		U	0.56		U	0.5
Aroclor-1262	µg/L		U	0.5		UL	0.5		U	0.5		U	0.5		U	0.51		U	0.56		U	0.5
Aroclor-1268	µg/L		U	0.5		UL	0.5		U	0.5		U	0.5		U	0.51		U	0.56		U	0.5

Sample Location		MW-CC-3			MW-CC-3			MW-CC-3			MW-CC-3			MW-CC-3			MW-CC-3			MW-CC-3		
Lab ID		820000			846803			881263			894385			939368			966599			997823		
Sample Date		4/4/2007			7/18/2007			11/29/2007			1/23/2008			7/30/2008			11/11/2008			4/22/2009		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater		
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Polychlorinated Biphenyls																						
Aroclor-1016	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.53		U	0.5		U	0.5
Aroclor-1221	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.53		U	0.5		U	0.5
Aroclor-1232	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.53		U	0.5		U	0.5
Aroclor-1242	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.53		U	0.5		U	0.5
Aroclor-1248	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.53		U	0.5		U	0.5
Aroclor-1254	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.53		U	0.5		U	0.5
Aroclor-1260	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.53		U	0.5		U	0.5
Aroclor-1262	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.53		U	0.5		U	0.5
Aroclor-1268	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.53		U	0.5		U	0.5

Sample Location		MW-CC-3			MW-CC-3			MW-CC-3		
Lab ID		8154-2			12503-4			21350-4		
Sample Date		11/18/2009			4/21/2010			12/17/2010		
Matrix		Groundwater			Groundwater			Groundwater		
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Polychlorinated Biphenyls										
Aroclor-1016	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1221	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1232	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1242	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1248	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1254	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1260	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1262	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1268	µg/L		U	0.51		U	0.51		U	0.5

Q - qualifier, RL - reporting limit, J - estimated, U - not detected, UJ - estimated reporting limit, NA - not analyzed

SUMMARY OF CONTAINMENT CELL POLYCHLORINATED BIPHENYL RESULTS
SW-846 ANALYSES
Paoli Rail Yard Superfund Site
Paoli, Pennsylvania

Sample Location		MW-CC-4			MW-CC-4			MW-CC-4			MW-CC-4			MW-CC-4			MW-CC-4			MM-CC-4		
Lab ID		652288			676174			700176			724128			764399			796020			806641		
Sample Date		7/12/2005			10/7/2005			1/5/2006			4/5/2006			8/22/2006			12/21/2006			2/8/2007		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater		
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Polychlorinated Biphenyls																						
Aroclor-1016	µg/L		U	0.5		U	0.5		U	0.5		U	0.51		U	0.52		U	0.5		U	0.5
Aroclor-1221	µg/L		U	0.5		U	0.5		U	0.5		U	0.51		U	0.52		U	0.5		U	0.5
Aroclor-1232	µg/L		U	0.5		U	0.5		U	0.5		U	0.51		U	0.52		U	0.5		U	0.5
Aroclor-1242	µg/L		U	0.5		U	0.5		U	0.5		U	0.51		U	0.52		U	0.5		U	0.5
Aroclor-1248	µg/L		U	0.5		U	0.5		U	0.5		U	0.51		U	0.52		U	0.5		U	0.5
Aroclor-1254	µg/L		U	0.5		U	0.5		U	0.5		U	0.51		U	0.52		U	0.5		U	0.5
Aroclor-1260	µg/L		U	0.5		U	0.5		U	0.5		U	0.51		U	0.52		U	0.5		U	0.5
Aroclor-1262	µg/L		U	0.5		U	0.5		U	0.5		U	0.51		U	0.52		U	0.5		U	0.5
Aroclor-1268	µg/L		U	0.5		U	0.5		U	0.5		U	0.51		U	0.52		U	0.5		U	0.5

Sample Location		MW-CC-4			MW-CC-4			MW-CC-4			MW-CC-4			MW-CC-4			MW-CC-4			MW-CC-4		
Lab ID		820001			846804			881266			894386			939369			966595			997824		
Sample Date		4/4/2007			7/18/2007			11/29/2007			1/23/2008			7/30/2008			11/11/2008			4/22/2009		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater		
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Polychlorinated Biphenyls																						
Aroclor-1016	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.52		U	0.5		U	0.5
Aroclor-1221	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.52		U	0.5		U	0.5
Aroclor-1232	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.52		U	0.5		U	0.5
Aroclor-1242	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.52		U	0.5		U	0.5
Aroclor-1248	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.52		U	0.5		U	0.5
Aroclor-1254	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.52		U	0.5		U	0.5
Aroclor-1260	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.52		U	0.5		U	0.5
Aroclor-1262	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.52		U	0.5		U	0.5
Aroclor-1268	µg/L		U	0.5		U	0.5		U	0.5		U	0.5		U	0.52		U	0.5		U	0.5

Sample Location		MW-CC-4			MW-CC-4			MW-CC-4		
Lab ID		8154-5			12503-5			21350-5		
Sample Date		11/19/2009			4/21/2010			12/17/2010		
Matrix		Groundwater			Groundwater			Groundwater		
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Polychlorinated Biphenyls										
Aroclor-1016	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1221	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1232	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1242	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1248	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1254	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1260	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1262	µg/L		U	0.51		U	0.51		U	0.5
Aroclor-1268	µg/L		U	0.51		U	0.51		U	0.5

Q - qualifier, RL - reporting limit, J - estimated, U - not detected, UJ - estimated reporting limit, NA - not analyzed

Attachment 5

Asphalt Cover Area Monitor Well Location Map and Analytical Results Summary for Benzene and PCBs in Ground Water

Revision	Description	Date	By
1	ADDED MW-WC & RW-15 AS PART OF RESPONSE TO USEPA COMMENT LETTER (DATED OCTOBER 21, 2005)	11/05	B.L.F.

N
W E
S

MW-11
GROUNDWATER TREATMENT BUILDING
INFILTRATION GALLERY
CEDAR HOLLOW ROAD
CENTRAL AVENUE
TREMELOW MILLSTOWN
MW-21
MW-20
MW-8
MW-17
RW-16
MW-16
RW-14
MW-14
MW-19
MW-18
MW-WC
RW-10
RW-15
MW-23
MW-22
MW-2
MW-1
MW-WA-R
GARAGE
PAVED AREA
FORMER GAS SHOP
ELECTRIC TRACTION SUBSTATION
TRANSFORMER

NOTES:

AERIAL TOPOGRAPHY CONDUCTED ON APRIL 9, 1993 BY AERIAL DATA REDUCTION ASSOCIATES, INC. OF PENNSAUKEN, NJ. (800)-257-7960 FIELD VERIFICATION CONDUCTED IN FALL 1997 BY HUNT ENGINEERING Co. OF MALVERN, PA (610)-644-4600.

LEGEND

◆ MW-1 – EXISTING WELL LOCATION

NOTE (BY EPA): WELLS MW-WC, MW-14, MW-16, MW-18, AND MW-19 ABANDONED; WELL MW-21 INACCESSIBLE

0 35 70 140
SCALE: FEET

J:\Paoli Rail Yard\DRAWINGS\2003-1123-10.9\2003-1123-10.9-07

REPORT ON REMEDY COMPLETION
FOR RAIL YARD SOILS, BUILDINGS, AND STRUCTURES
PAOLI RAIL YARD SUPERFUND SITE
PAOLI, PENNSYLVANIA

Scale: 1"=140'	ASPHALT CAP MONITORING WELL LOCATIONS
Originated By: A.U.	
Drawn By: P.S.G.	
Checked By: B.B.B.	
Project Mgr: P.G.S.	
Dwg No. 2003-1123-10.9-07	
Issued: NOV 30 2006	Project No. 2003-1123-10.9

Advanced GeoServices Corp.
1055 Andrew Drive Suite A
West Chester, Pennsylvania 19380
(610) 840-9100
FAX: (610) 840-9199

FIGURE: 1-3

GROUND WATER DETECTIONS FROM OCTOBER 2002 – DECEMBER 2010

Paoli Rail Yard Superfund Site
Paoli, Pennsylvania

Well ID	Date	Total DRO mg/L	Total GRO µg/L	Alkalinity mg/L	Nitrate mg/L	Sulfate mg/L	Methane µg/L	Ferrous Iron mg/L	Aroclor 1254 µg/L	Aroclor 1260 µg/L	Benzene µg/L	Ethylbenzene µg/L	Toluene µg/L
MW-1	Oct-02	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-03	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Apr-03	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jul-03	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Oct-03	0.12	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-04	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Apr-04	ND	ND	258	2.2	40.5	ND	ND	ND	ND	ND	ND	ND
	Jul-04	ND	ND	192	2.9	123	ND	ND	ND	ND	ND	ND	ND
	Oct-04	ND	ND	150	3.6	43.1	ND	ND	ND	ND	ND	ND	ND
	Jan-05	ND	ND	132	5.1	48.2	ND	ND	ND	ND	ND	ND	ND
	Apr-05	ND	ND	106	3.4	51.3	ND	ND	ND	ND	ND	ND	ND
	Jul-05	ND	ND	120	3.9	43.7	ND	ND	ND	ND	ND	ND	ND
	Oct-05	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Aug-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Dec-06	ND	ND	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
	Feb-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Nov-07	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Nov-08	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Nov-09	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Aug-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Dec-10	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
MW-2	Oct-02	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jan-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Oct-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jan-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-04	ND	ND	37.8	2.6	52.7	ND	0.16 J	ND	ND	ND	ND	ND
	Jul-04	ND	ND	41	3.1	55.4	ND	ND	ND	ND	ND	ND	ND
	Oct-04	ND	ND	43	2.9	59.1	ND	ND	ND	ND	ND	ND	ND
	Jan-05	ND	ND	46	2.7	53	ND	ND	ND	ND	ND	ND	ND
	Apr-05	ND	ND	34.7	2.6	56.9	ND	ND	ND	ND	ND	ND	ND
	Jul-05	ND	ND	36.1	1.97	52.4	ND	ND	ND	ND	ND	ND	ND
	Oct-05	0.11 J	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Aug-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Dec-06	ND	ND	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND
	Feb-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Nov-07	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Nov-08	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Nov-09	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Aug-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Dec-10	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND

GROUND WATER DETECTIONS FROM OCTOBER 2002 – DECEMBER 2010

Paoli Rail Yard Superfund Site
Paoli, Pennsylvania

Well ID	Date	Total DRO mg/L	Total GRO µg/L	Alkalinity mg/L	Nitrate mg/L	Sulfate mg/L	Methane µg/L	Ferrous Iron mg/L	Aroclor 1254 µg/L	Aroclor 1260 µg/L	Benzene µg/L	Ethylbenzene µg/L	Toluene µg/L
MW-8	Oct-02	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jan-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Oct-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jan-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-04	0.6	160	76.7	1.2	21.3	70	0.3 J	ND	ND	1.2	ND	ND
	Jul-04	0.78	130	89	0.25	19.3	120	ND	ND	ND	1	ND	ND
	Oct-04	0.36	190	79	0.75	17.3	44	0.21 J	ND	ND	1.2 J	ND	ND
	Jan-05	ND	250	95	ND	18.5	140	ND	ND	ND	1.3 J	ND	ND
	Apr-05	0.5	130	78.9	1.6	14.6	13	ND	ND	ND	1	ND	ND
	Jul-05	0.53	140	93.7	0.24 J	17.1	120	ND	ND	ND	ND	ND	ND
	Oct-05	ND	170	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Aug-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Dec-06	0.5	220	NS	NS	NS	NS	NS	ND	ND	1.1 J	ND	ND
	Feb-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Nov-07	0.2	180	NA	NA	NA	NA	NA	ND	ND	0.5 J	ND	ND
	Jan-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Nov-08	0.19	72	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Nov-09	ND	140	NA	NA	NA	NA	NA	ND	ND	0.3 J	ND	ND
	Jan-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Aug-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Dec-10	0.28	330	NA	NA	NA	NA	NA	ND	ND	0.49	ND	ND
MW-11	Oct-02	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jan-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Oct-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jan-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Oct-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jan-05	ND	ND	163	11	6.5	260	ND	ND	ND	ND	ND	ND
	Apr-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Oct-05	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Aug-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Dec-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Feb-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Nov-07	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Jan-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Nov-08	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Jan-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Nov-09	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Jan-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Aug-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Dec-10	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA

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Well ID	Date	Total DRO mg/L	Total GRO µg/L	Alkalinity mg/L	Nitrate mg/L	Sulfate mg/L	Methane µg/L	Ferrous Iron mg/L	Aroclor 1254 µg/L	Aroclor 1260 µg/L	Benzene µg/L	Ethylbenzene µg/L	Toluene µg/L
MW-14	Oct-02	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jan-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Oct-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jan-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-04	1.1 K	ND	118	ND	14.7	220	23.8 J	ND	ND	ND	ND	ND
	Jul-04	0.88	ND	99	ND	10.1	280	19.1 J	ND	ND	ND	ND	0.7 J
	Oct-04	3.4	ND	84	ND	17.7	89	10 J	ND	0.66	ND	ND	ND
	Jan-05	A	A	A	A	A	A	A	A	A	A	A	A
MW-16	Oct-02	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jan-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Oct-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jan-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-04	25.6	50	96.6	2.3	16.1	7.8	9.9	ND	2.2	ND	ND	ND
	Jul-04	15.8	ND	152	0.51	22.1	22	20.8 J	ND	1.9	ND	ND	ND
	Oct-04	4.4	ND	127	0.29	58	7.7	4 J	ND	1.5	ND	ND	ND
	Jan-05	A	A	A	A	A	A	A	A	A	A	A	A
MW-17	Oct-02	0.12	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-03	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Apr-03	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jul-03	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Oct-03	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-04	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Apr-04	ND	ND	21.5	1.6	27.5	ND	ND	ND	ND	ND	ND	ND
	Jul-04	0.52	ND	32	1.7	32.4	ND	ND	ND	ND	ND	ND	ND
	Oct-04	ND	ND	31	1.6	30.8	ND	ND	ND	ND	ND	ND	ND
	Jan-05	ND	ND	29	1.6	30.5	ND	ND	ND	ND	ND	ND	ND
	Apr-05	ND	ND	22.4	1.5	38.4	ND	ND	ND	ND	ND	ND	ND
	Jul-05	ND	ND	36.6	1.5	17.5	ND	ND	ND	ND	ND	ND	ND
	Oct-05	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Aug-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Dec-06	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Feb-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Nov-07	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Nov-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jan-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Nov-09	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Aug-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Dec-10	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND

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Well ID	Date	Total DRO mg/L	Total GRO µg/L	Alkalinity mg/L	Nitrate mg/L	Sulfate mg/L	Methane µg/L	Ferrous Iron mg/L	Aroclor 1254 µg/L	Aroclor 1260 µg/L	Benzene µg/L	Ethylbenzene µg/L	Toluene µg/L
MW-18	Oct-02	0.34	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-03	0.63	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Apr-03	0.12 J	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jul-03	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Oct-03	0.47	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-04	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Apr-04	0.27	ND	283	0.16	51.2	11	0.47 J	ND	ND	ND	ND	ND
	Jul-04	0.61	ND	351	ND	31.4	38	ND	ND	ND	ND	ND	0.5 J
	Oct-04	0.26 L	ND	394	0.68	133	6.6	0.19 J	ND	ND	ND	ND	ND
	Jan-05	ND	ND	424	ND	59.4	220	ND	ND	ND	ND	ND	ND
	Apr-05	0.6	ND	425	0.44	101	42	ND	ND	ND	ND	ND	ND
	Jul-05	0.79	ND	430	ND	13.9	240	ND	ND	ND	ND	ND	ND
	Oct-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Nov-05	Abandonment proposed for MW-18											
	Mar-10	A	A	A	A	A	A	A	A	A	A	A	A
MW-19	Oct-02	0.86	73	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-03	1	57	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Apr-03	1.2 J	86	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jul-03	ND	57	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Oct-03	0.96	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-04	0.66	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Apr-04	0.7	ND	206	ND	16.5	56	6.1 J	ND	ND	ND	ND	ND
	Jul-04	1.2	ND	210	ND	15.3	76	5.8 J	ND	ND	ND	ND	ND
	Oct-04	0.96	58	237	ND	16	48	0.78 J	ND	ND	ND	ND	ND
	Jan-05	A	A	A	A	A	A	A	A	A	A	A	A
MW-20	Oct-02	0.61	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-03	0.36	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Apr-03	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jul-03	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Oct-03	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-04	0.24	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Apr-04	ND	ND	9.45	13.7	ND	ND	ND	ND	ND	ND	ND	ND
	Jul-04	ND	ND	35	7.9	24.6	ND	ND	ND	ND	ND	ND	ND
	Oct-04	ND	ND	21	19.1	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-05	0.25	ND	17	35.7	ND	ND	ND	ND	ND	ND	ND	ND
	Apr-05	ND	ND	9.03	18	ND	ND	ND	ND	ND	ND	ND	ND
	Jul-05	ND	ND	6.61	15.8	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-05	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-06	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Apr-06	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Aug-06	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Dec-06	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Feb-07	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Apr-07	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Jul-07	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Nov-07	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-08	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Apr-08	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Jul-08	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Nov-08	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-09	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Apr-09	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Jul-09	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Nov-09	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-10	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Apr-10	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Aug-10	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Dec-10	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND

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Well ID	Date	Total DRO mg/L	Total GRO µg/L	Alkalinity mg/L	Nitrate mg/L	Sulfate mg/L	Methane µg/L	Ferrous Iron mg/L	Aroclor 1254 µg/L	Aroclor 1260 µg/L	Benzene µg/L	Ethylbenzene µg/L	Toluene µg/L
MW-21	Oct-02	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jan-03	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Apr-03	0.17 J	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jul-03	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Oct-03	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-04	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Apr-04	0.16	ND	12.1	4.5	29.4	ND	ND	ND	ND	ND	ND	ND
	Jul-04	ND	ND	19	14.3	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-04	ND	ND	ND	8.9	10.1	ND	ND	ND	ND	ND	ND	ND
	Jan-05	ND	ND	ND	7.5	7.3	ND	ND	ND	ND	ND	ND	ND
	Apr-05	ND	ND	5.21	7.6	5.1	ND	ND	ND	ND	ND	ND	ND
	Jul-05	ND	ND	20.3	8.1	12.7	ND	ND	ND	ND	ND	ND	ND
	Oct-05	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Aug-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Dec-06	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Feb-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Nov-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jan-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Nov-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jan-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Nov-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jan-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Aug-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Dec-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-22	Oct-02	2 J	4,100	NA	NA	NA	NA	NA	ND	ND	3,000	ND	ND
	Jan-03	3.7	5,800	NA	NA	NA	NA	NA	ND	ND	140	5.1	ND
	Apr-03	2.0	8,400	NA	NA	NA	NA	NA	ND	ND	290	ND	ND
	Jul-03	ND	7,600	NA	NA	NA	NA	NA	ND	ND	4,600 J	280 J	ND
	Oct-03	1.7	15,000 J	NA	NA	NA	NA	NA	ND	ND	200	ND	ND
	Jan-04	0.67	5,400	NA	NA	NA	NA	NA	ND	ND	180	ND	ND
	Apr-04	1.1	2,200	268	1.2	80	180	3.7 J	ND	ND	130	ND	ND
	Jul-04	0.66	960 J	250	3.0	70.3 J	110	0.32 J	ND	ND	36	ND	ND
	Oct-04	1.1	4,600	283	0.1	16	260 J	ND	ND	ND	260	ND	60 J
	Jan-05	ND	2,300	289	ND	49	240	0.11 J	ND	ND	62	ND	ND
	Apr-05	0.9	5,400	282	ND	18.6	440	2.4	ND	ND	600	ND	ND
	Jul-05	450	3,200	245	ND	31.4	31	ND	24,000	53,000	44 J	ND	ND
	Oct-05	4.3 J	1,900	277	ND	28	180	3.6 J	ND	3,100	23	ND	ND
	Jan-06	NA	NA	176	ND	155	59	2.0 J	10 J	22	1.9 J	ND	ND
	Apr-06	NA	NA	236	0.13	73	38	5.5	ND	ND	3.2 J	ND	ND
	Aug-06	NA	NA	237	0.12	60.2	33	2.8	ND	2.2	6.6	ND	ND
	Dec-06	0.8	460	256	ND	70.2	36	6.8 J	ND	2.4 J	10	ND	ND
	Feb-07	NA	NA	240	ND	54.5	60	ND	NA	NA	6.4	ND	ND
	Apr-07	NA	NA	257	ND	66.5	47	0.59 J	NA	NA	9.9	ND	ND
	Jul-07	NA	NA	230	0.12	74.1	22	ND	NA	NA	8	ND	ND
	Nov-07	1.3	1300	271	0.13	18.3 J	80	ND	ND	38	86	ND	ND
	Jan-08	NA	NA	214	ND	69.9	54	9.1 J	NA	NA	3	0.3 J	ND
	Feb-08	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.5	NA	NA
	Feb-08	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.8J	NA	NA
	Mar-08	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.7J	NA	NA
	Apr-08	NA	NA	213	ND	67.7	31	1.4	NA	NA	0.8J	ND	ND
	May-08	NA	NA	176	NA	NA	NA	NA	NA	NA	0.6J	NA	NA
	Jul-08	NA	NA	185	ND	101	20	R	NA	NA	0.4J	ND	ND
	Nov-08	0.99	130 J	237	ND	40.3	66	8.6	ND	ND	0.6 J	ND	ND
	Jan-09	NA	NA	245	0.19	50.4	67	8.5	NA	NA	0.5 J	ND	ND
	Apr-09	NA	NA	218	ND	52.8	67	R	NA	NA	0.9 J	ND	ND
	Jul-09	NA	NA	238	ND	53.7	69	R	NA	NA	0.33 J	ND	ND
	Nov-09	0.22 J	67	223	ND	73.8	25	0.1 U	ND	ND	1.3	ND	ND
	Jan-10	NA	NA	211	ND	79.9 J	38	R	NA	NA	0.79 J	ND	ND
	Apr-10	NA	NA	207	ND	68.7	60	0.13 R	NA	NA	9.2	ND	ND
	Jun-10	NA	NA	NA	NA	NA	NA	NA	NA	NA	11	ND	ND
	Aug-10	NA	NA	204	ND	48.4	81	0.25 R	ND	ND	0.66	ND	ND
	Dec-10	0.54	42	217	0.045	59.5	21	0.028	ND	ND	0.34	ND	ND

GROUND WATER DETECTIONS FROM OCTOBER 2002 – DECEMBER 2010

Paoli Rail Yard Superfund Site
Paoli, Pennsylvania

Well ID	Date	Total DRO mg/L	Total GRO µg/L	Alkalinity mg/L	Nitrate mg/L	Sulfate mg/L	Methane µg/L	Ferrous Iron mg/L	Aroclor 1254 µg/L	Aroclor 1260 µg/L	Benzene µg/L	Ethylbenzene µg/L	Toluene µg/L
MW-23	Oct-02	1.3	340	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-03	1.1	370	NA	NA	NA	NA	NA	ND	ND	1.0	ND	ND
	Apr-03	0.68 J	190	NA	NA	NA	NA	NA	ND	ND	0.6 J	ND	ND
	Jul-03	ND	270	NA	NA	NA	NA	NA	ND	ND	0.8 J	ND	ND
	Oct-03	0.83	290	NA	NA	NA	NA	NA	ND	ND	0.8 J	ND	ND
	Jan-04	0.28	190	NA	NA	NA	NA	NA	ND	ND	0.6 J	ND	ND
	Apr-04	0.33	ND	87.2	1.2	79.9	5.1	ND	ND	ND	ND	ND	ND
	Jul-04	0.18	ND	97	3.6	261	ND	ND	ND	ND	ND	ND	ND
	Oct-04	0.57	ND	133	0.17	150	14	ND	ND	ND	ND	ND	ND
	Jan-05	ND	ND	171	0.12	100	52	ND	ND	ND	ND	ND	ND
	Apr-05	0.4	ND	101	0.46	124	8.5	ND	ND	ND	ND	ND	ND
	Jul-05	0.49	ND	203	ND	38.1	19	ND	ND	ND	ND	ND	ND
	Oct-05	ND	68	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-06	NA	NA	137	0.79 J	68.4	11	ND	NA	NA	ND	ND	ND
	Apr-06	NA	NA	201	0.14	37.1	110	4.8	NA	NA	ND	ND	ND
	Aug-06	NA	NA	213	ND	25.6	64	1.3	NS	NS	0.5 J	ND	ND
	Dec-06	0.6	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Feb-07	NA	NA	191	ND	36.6	86	2.2	NA	NA	ND	ND	ND
	Apr-07	NA	NA	97.4	ND	106	18	ND	NA	NA	ND	ND	ND
	Jul-07	NA	NA	184	0.13	34	30	ND	NA	NA	0.2 J	ND	ND
	Nov-07	0.26	71	212	0.14	28.5 J	45	2.3 J	ND	ND	0.3 J	ND	ND
	Jan-08	NA	NA	143	0.72	33.5	24	0.13 J	NA	NA	ND	ND	ND
	Apr-08	NA	NA	124	0.27	49.9	27	0.16	NA	NA	ND	ND	ND
	Jul-08	NA	NA	128	0.55	44.2	22	ND	NA	NA	ND	ND	ND
	Nov-08	0.19	ND	204	ND	16.7	100	3.3 J	ND	ND	ND	ND	ND
	Jan-09	NA	NA	146	0.17	48.3	29	R	NA	NA	ND	ND	ND
	Apr-09	NA	NA	142	0.23	44.5	27	R	NA	NA	R	ND	ND
	Jul-09	NA	NA	178	ND	38.5	80	R	NA	NA	R	ND	ND
	Nov-09	0.24	ND	141	0.17	48.3	16	0.047 R	ND	ND	ND	ND	ND
	Jan-10	NA	NA	126	0.12 J	66	18	0.024 R	NA	NA	ND	ND	ND
	Apr-10	NA	NA	111	0.11 J	75.4	14	R	NA	NA	ND	ND	ND
	Aug-10	NA	NA	190	ND	26.3	89	0.058 R	NA	NA	ND	ND	ND
	Dec-10	0.48	ND	201	ND	35.3	62	0.054	ND	ND	ND	ND	ND
MW-WA-R	Oct-02	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	Jan-03	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	Apr-03	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	Jul-03	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	Oct-03	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	Jan-04	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	Apr-04	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	Jul-04	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	Oct-04	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	Jan-05	ND	ND	55	2.2	62.6	ND	0.11 J	ND	ND	ND	ND	ND
	Apr-05	ND	ND	53.6	2.4	57.8	ND	ND	ND	ND	ND	ND	ND
	Jul-05	ND	ND	40.1	2.3	47.7	ND	ND	ND	ND	ND	ND	ND
	Oct-05	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Aug-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Dec-06	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Feb-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Nov-07	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Nov-08	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Nov-09	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Aug-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Dec-10	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND

GROUND WATER DETECTIONS FROM OCTOBER 2002 – DECEMBER 2010

Paoli Rail Yard Superfund Site
Paoli, Pennsylvania

Well ID	Date	Total DRO mg/L	Total GRO µg/L	Alkalinity mg/L	Nitrate mg/L	Sulfate mg/L	Methane µg/L	Ferrous Iron mg/L	Aroclor 1254 µg/L	Aroclor 1260 µg/L	Benzene µg/L	Ethylbenzene µg/L	Toluene µg/L
RW-10	Oct-02	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jan-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Oct-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jan-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-04	1.5	ND	185	2.1	297	12	0.19	ND	2.3	ND	ND	ND
	Jul-04	1.1	ND	273	3.5	370	32	0.1 J	ND	0.86	ND	ND	ND
	Oct-04	ND	ND	288	ND	138	160	ND	ND	ND	ND	ND	ND
	Jan-05	1.3	ND	310	ND	126	150	0.66 J	ND	ND	ND	ND	ND
	Apr-05	0.8	ND	241	1.2	133	30	ND	ND	ND	ND	ND	ND
	Jul-05	1.0	ND	264	ND	127	120	3.1 J	ND	ND	ND	ND	ND
	Oct-05	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-06	NA	NA	NA	NA	NA	NA	NA	ND	0.77	NA	NA	NA
	Apr-06	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Aug-06	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Dec-06	0.8	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Feb-07	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Apr-07	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Jul-07	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Nov-07	0.35	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-08	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Apr-08	NA	NA	NA	NA	NA	NA	NA	ND	1.6	NA	NA	NA
	Jul-08	NA	NA	NA	NA	NA	NA	NA	ND	1.1	NA	NA	NA
	Nov-08	0.29	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-09	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Apr-09	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Jul-09	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Nov-09	0.38	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-10	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Apr-10	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Aug-10	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Dec-10	ND	ND	NA	NA	NA	NA	NA	0.36	0.51	ND	ND	ND
RW-14	Oct-02	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jan-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Oct-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jan-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-04	ND	ND	53	0.22	9.4	ND	0.41	ND	2.2	ND	ND	ND
	Jul-04	0.12	ND	46	0.13	12	ND	ND	ND	4.5	ND	ND	ND
	Oct-04	ND	85	31.5	0.34	52.9	11	0.55 J	ND	1.7	2.2	ND	ND
	Jan-05	ND	57	104	0.1	369	15	16.4 J	ND	ND	1 J	ND	ND
	Apr-05	ND	ND	56.3	0.3	15.8	ND	ND	ND	ND	ND	ND	ND
	Jul-05	0.11	ND	111	ND	51.7	24	10.6 J	ND	ND	ND	ND	ND
	Oct-05	ND	72	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-06	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Apr-06	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Aug-06	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Dec-06	0.5	130	NA	NA	NA	NA	NA	ND	ND	1.1	ND	ND
	Feb-07	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Apr-07	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Jul-07	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Nov-07	0.64	200	NA	NA	NA	NA	NA	ND	ND	0.8 J	ND	ND
	Jan-08	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Apr-08	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Jul-08	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Nov-08	0.17	190	NA	NA	NA	NA	NA	ND	ND	0.5 J	ND	ND
	Jan-09	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Apr-09	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Jul-09	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Nov-09	0.63	420	NA	NA	NA	NA	NA	ND	ND	1.6	ND	ND
	Jan-10	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Apr-10	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Aug-10	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Dec-10	0.52	310	NA	NA	NA	NA	NA	ND	ND	0.9	ND	ND

GROUND WATER DETECTIONS FROM OCTOBER 2002 – DECEMBER 2010

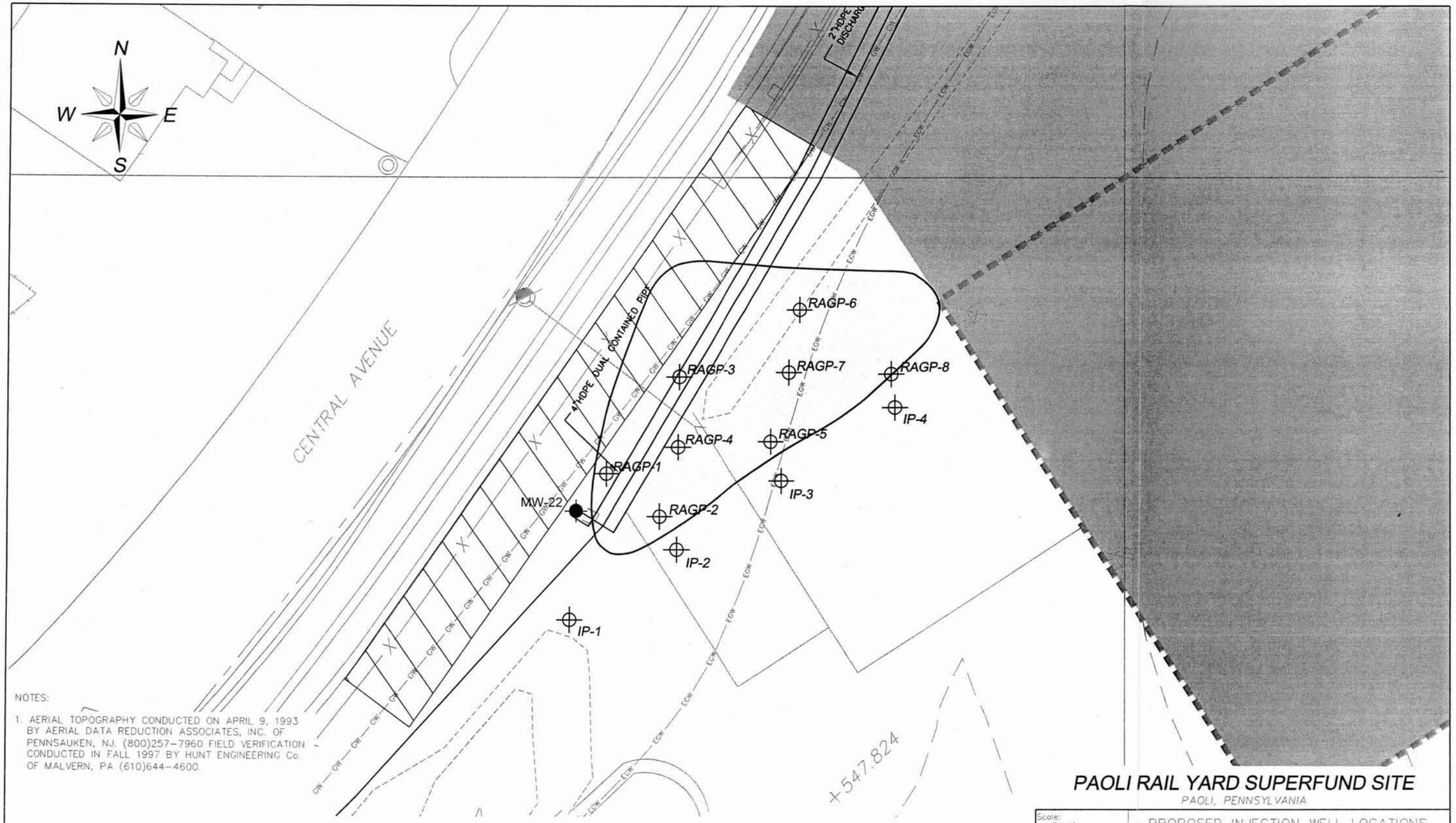
Paoli Rail Yard Superfund Site
Paoli, Pennsylvania

Well ID	Date	Total DRO	Total GRO	Alkalinity	Nitrate	Sulfate	Methane	Ferrous Iron	Aroclor 1254	Aroclor 1260	Benzene	Ethylbenzene	Toluene
		mg/L	µg/L	mg/L	mg/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L
RW-16	Oct-02	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jan-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jul-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Oct-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Jan-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Apr-04	**2.4**	ND	**167**	**2.7**	**33.3**	**9.4**	**0.41**	ND	ND	ND	ND	ND
	Jul-04	**0.77**	ND	**92**	**0.34**	**19.7**	ND	ND	ND	**2.9**	ND	ND	ND
	Oct-04	ND	ND	**242**	**0.49**	**69.7**	ND	ND	ND	**0.83**	ND	ND	ND
	Jan-05	**0.57**	ND	**144**	**3.3**	**53**	**6.1**	**0.61**	ND	ND	ND	ND	ND
	Apr-05	**0.7**	ND	**123**	**1.3**	**29.7**	**6**	**0.2**	ND	ND	ND	ND	ND
	Jul-05	**1.8**	ND	**187**	ND	**33.4**	**41**	**35.2 J**	ND	ND	ND	ND	ND
	Oct-05	ND	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-06	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Apr-06	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Aug-06	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Dec-06	**1.3**	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Feb-07	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Apr-07	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Jul-07	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Nov-07	**1**	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-08	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Apr-08	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Jul-08	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Nov-08	**0.2**	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-09	NA	NA	NA	NA	NA	NA	NA	ND	**2.5**	NA	NA	NA
	Apr-09	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Jul-09	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Nov-09	**0.98**	ND	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND
	Jan-09	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Apr-10	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Aug-10	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA
	Dec-10	**1.3**	**31**	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND

NA - Not Analyzed ND - Not Detected NI - Not Installed A - Abandoned NS - Not Sampled
J - Estimated L - Estimated Biased Low K - Estimated Biased High R - Data Point Rejected During Validation

Attachment 6

Detail of Injection Well Complex near Monitor Well MW-22 and Analytical Results Summary for Benzene in Ground Water in MW-22 and Injection Wells



NOTES:

1. AERIAL TOPOGRAPHY CONDUCTED ON APRIL 9, 1993 BY AERIAL DATA REDUCTION ASSOCIATES, INC. OF PENNSAUKEN, NJ. (800)257-7960 FIELD VERIFICATION CONDUCTED IN FALL 1997 BY HUNT ENGINEERING Co. OF MALVERN, PA (610)644-4600.

LEGEND

MW-22 – MONITORING WELL LOCATION

– ASPHALT COVER AREA

– CLEAN BACKFILL DUE TO STONE WALL CONSTRUCTION

– VOLATILE ORGANIC IMPACTED SOIL AREA DETERMINED BY ORGANIC VAPOR ANALYZER RESULTS: DEPTH OF IMPACTED SOIL RANGES FROM 19 FT. TO 22 FT. BELOW THE GROUND LEVEL.

IP-1 – PROPOSED INJECTION POINT LOCATION.

0 7.5 15
SCALE: FEET

J:\Paoli Rail Yard\DRAWINGS\2003-1123-6.3\2003-1123-6.3-13

PAOLI RAIL YARD SUPERFUND SITE

PAOLI, PENNSYLVANIA

PROPOSED INJECTION WELL LOCATIONS
JULY AND AUGUST, 2007

Scale:	1"=15'
Originated By:	B.B.B
Drawn By:	A.H.C
Checked By:	
Project Mgr:	P.G.S.
Dwg No.	2003-1123-6.3-11
Revised:	JUL 24 2007

Advanced GeoServices Corp.
1055 Andrew Drive Suite A
West Chester, Pennsylvania 19380
(610) 840-9100
FAX: (610) 840-9199

Project No. 2003-1123-6.3

FIGURE: 2

Paoli Rail Yard
In-Situ Groundwater Treatment Monitoring
Injection Wells and MW-22

Sample Location		IP-1			IP-1			IP-1			IP-1			IP-1			IP-1			IP-1			IP-1			IP-1			IP-1		
Lab ID		899037			901486			904493			913620			921492			939131			967314			981051			997604			3985-1		
Sample Date		2/12/2008			2/26/2008			3/11/2008			4/17/2008			5/20/2008			7/30/2008			11/14/2008			1/27/2009			4/22/2009			7/21/2009		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater		
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Volatiles																															
Benzene	ug/L		U	1		U	1		U	1		U	1		U	1		U	1		U	1		U	1		R	1		R	1
Total Metals																															
Magnesium	ug/L		NA			NA			NA			NA			UJ	416	181	J	33.6	5000	U	33.6	140	J	33.6	195	J	41.6	18300		5000
Conventionals																															
Alkalinity	mg/L		NA			NA			NA		1740		5	1650		5	1700		5		NA		995		5	1170		5	1440		5
Alkalinity - Bicarbonate	mg/L		U	5		U	5		U	5		U	5		U	5		U	5		U	5		U	5		U	5		U	5
Alkalinity - Carbonate	mg/L	65.4		5	50.6		5	60.7		5	65.9		5	64.9		5	68.1		5	108		5	73.9		5	74.9		5	91.2		5
Carbon Dioxide	mg/L		NA			NA			NA			NA			UJ	5		UJ	5		U	5		U	5		U	5		UJ	5

Sample Location		IP-1			IP-1			IP-1			IP-1			IP-1		
Lab ID		8152-1			9691-1			12510-1			460-16766-1			21191-1		
Sample Date		11/19/2009			1/13/2010			4/22/2010			8/25/2010			12/15/2010		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater			Groundwater		
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Volatiles																
Benzene	ug/L	0.91	J	1	4.2		1	0.6	J	1	0.25	J	1		U	
Total Metals																
Magnesium	ug/L	295	J	5000	396	J	5000	793	J	5000	765	J	5000	272	J	
Conventionals																
Alkalinity	mg/L	315		5	130		5	204		5	2700		5	1900		
Alkalinity - Bicarbonate	mg/L		U	5		U	5		U	5		U	5		U	
Alkalinity - Carbonate	mg/L	68		5	39.8		5	31.5		5	123		5	162		
Carbon Dioxide	mg/L		R	5		UJ	5		R	5		UJ	5		U	

Q - qualifier, RL - reporting limit, J - estimated, U - not detected, UJ - estimated reporting limit, NA - not analyzed

Paoli Rail Yard
In-Situ Groundwater Treatment Monitoring
Injection Wells and MW-22

Sample Location		IP-2			IP-2			IP-2			IP-2			IP-2			IP-2			IP-2			IP-2			IP-2			IP-2		
Lab ID		899038			901487			904494			913621			921493			939132			967315			981052			997605			3985-2		
Sample Date		2/12/2008			2/26/2008			3/11/2008			4/17/2008			5/20/2008			7/30/2008			11/14/2008			1/27/2009			4/22/2009			7/21/2009		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater		
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Volatiles																															
Benzene	ug/L		U	1		U	1		U	1		U	1		U	1		U	1		U	1		U	1		R	1		R	1
Total Metals																															
Magnesium	ug/L		NA			NA			NA			NA		393	J	42	566	J	33.6	214	J	33.6	275	J	33.6	275	J	41.6	228	J	5000
Conventionals																															
Alkalinity	mg/L		NA			NA			NA		615		5	363		5	702		5		NA		342		5	474		5	576		5
Alkalinity - Bicarbonate	mg/L		U	5		U	5		U	5		U	5		U	5		U	5		U	5		U	5		U	5		U	5
Alkalinity - Carbonate	mg/L	49.8		5	51.2		5	45.1		5	49.9		5	38.7		5	40.9		5	43		5	46.2		5	41.8		5	56.4		5
Carbon Dioxide	mg/L		NA			NA			NA			NA			UJ	5		UJ	5		U	5		U	5		U	5		UJ	5

Sample Location		IP-2			IP-2			IP-2			IP-2			IP-2		
Lab ID		8152-2			9691-2			12510-2			460-16766-2			21191-2		
Sample Date		11/19/2009			1/13/2010			4/22/2010			8/25/2010			12/15/2010		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater			Groundwater		
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Volatiles																
Benzene	ug/L		U	1		U	1		U	1		U	1		U	
Total Metals																
Magnesium	ug/L	1770	J	5000	2640	J	5000	3160	J	5000	798	J	5000	541	J	
Conventionals																
Alkalinity	mg/L	20.2		5	72		5	42.9		5	2490		5	584		
Alkalinity - Bicarbonate	mg/L	9.3		5	51.7		5	24.8		5		U	5		U	
Alkalinity - Carbonate	mg/L	10.9		5	20.3		5	18.1		5	102		5	63.2		
Carbon Dioxide	mg/L		R	5		UJ	5		R	5		UJ	5		U	

Q - qualifier, RL - reporting limit, J - estimated, U - not detected, UJ - estimated reporting limit, NA - not analyzed

Paoli Rail Yard
In-Situ Groundwater Treatment Monitoring
Injection Wells and MW-22

Sample Location		IP-3			IP-3			IP-3			IP-3			IP-3			IP-3			IP-3			IP-3			IP-3			IP-3		
Lab ID		899039			901489			904495			913622			921494			939133			967316			981053			997606			3985-3		
Sample Date		2/12/2008			2/26/2008			3/11/2008			4/17/2008			5/20/2008			7/30/2008			11/14/2008			1/27/2009			4/22/2009			7/21/2009		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater		
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Volatiles																															
Benzene	ug/L	0.6	J	1	1.1		1	0.4	J	1	0.5	J	1	1		1	0.6	J	1	0.4	J	1		U	1	1.5	J	1		R	1
Total Metals																															
Magnesium	ug/L		NA			NA			NA			NA		5750		42	4990	J	33.6	2240	J	33.6	6420		33.6	6720		41.6	4580	J	5000
Conventionals																															
Alkalinity	mg/L		NA			NA			NA		155		5	149		5	118		5		NA		181		5	200		5	182		5
Alkalinity - Bicarbonate	mg/L	31.3		5	235		5	188		5	113		5	91.5		5	76.8		5	63.8		5	181		5	184		5	142		5
Alkalinity - Carbonate	mg/L	132		5		U	5	7.3		5	42.2		5	57.9		5	41.7		5	119		5		U	5	15.9		5	39		5
Carbon Dioxide	mg/L		NA			NA			NA			NA			UJ	5		UJ	5		U	5		U	5		U	5		UJ	5

Sample Location		IP-3			IP-3			IP-3			IP-3			IP-3		
Lab ID		8152-3			9691-3			12510-3			460-16766-3			21191-3		
Sample Date		11/19/2009			1/13/2010			4/22/2010			8/25/2010			12/15/2010		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater			Groundwater		
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Volatiles																
Benzene	ug/L		U	1		U	1		U	1	1.1		1	0.83	J	
Total Metals																
Magnesium	ug/L	19400		5000	21900		5000	18400		5000	2200	J	5000	4540	J	
Conventionals																
Alkalinity	mg/L	344		5	371		5	376		5	529		5	151		
Alkalinity - Bicarbonate	mg/L	344		5	371		5	376		5		U	5		U	
Alkalinity - Carbonate	mg/L		U	5		U	5		U	5	44.2		5	85		
Carbon Dioxide	mg/L	18.4	R	5	15.6	J	5	18.8	R	5		UJ	5		U	

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Paoli Rail Yard
In-Situ Groundwater Treatment Monitoring
Injection Wells and MW-22

Sample Location		IP-4			IP-4			IP-4			IP-4			IP-4			IP-4			IP-4			IP-4			IP-4			IP-4		
Lab ID		899040			901488			904496			913623			921495			939134			967317			981054			997607			3985-4		
Sample Date		2/12/2008			2/26/2008			3/11/2008			4/17/2008			5/20/2008			7/30/2008			11/14/2008			1/27/2009			4/22/2009			7/21/2009		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater		
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Volatiles																															
Benzene	ug/L	0.6	J	1	0.4	J	1	42		1	0.4	J	1	150		1	1.4		1	0.8	J	1		U	1	0.4	J	1		R	1
Total Metals																															
Magnesium	ug/L		NA			NA			NA			NA		15400		42	11100		33.6	9350		33.6	8120		33.6	6660		41.6	7380		5000
Conventionals																															
Alkalinity	mg/L		NA			NA			NA		233		5	243		5	243		5		NA		249		5	202		5	290		5
Alkalinity - Bicarbonate	mg/L	251		5	97.2		5	226		5	233		5	243		5	243		5	242		5	249		5	202		5	290		5
Alkalinity - Carbonate	mg/L		U	5	78.3		5		U	5		U	5		U	5		U	5		U	5		U	5		U	5		U	5
Carbon Dioxide	mg/L		NA			NA			NA			NA		20.7	J	5	33	J	5	59.6		5	14.5		5	24.3		5	23.8	J	5

Sample Location		IP-4			IP-4			IP-4			IP-4			IP-4		
Lab ID		8152-4			9691-4			12510-4			460-16766-4			12510-4		
Sample Date		11/19/2009			1/13/2010			4/22/2010			8/25/2010			12/15/2010		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater			Groundwater		
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Volatiles																
Benzene	ug/L		U	1		U	1		U	1	20		1	12		
Total Metals																
Magnesium	ug/L	7050		5000	6960		5000	7080		5000	900	J	5000	2680	J	
Conventionals																
Alkalinity	mg/L	229		5	231		5	253		5	221		5	136		
Alkalinity - Bicarbonate	mg/L	229		5	231		5	253		5		U	5		U	
Alkalinity - Carbonate	mg/L		U	5		U	5		U	5	49.6		5	79.8		
Carbon Dioxide	mg/L	29.1	R	5	24.4	J	5	22.3	R	5		UJ	5		U	

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Paoli Rail Yard
In-Situ Groundwater Treatment Monitoring
Injection Wells and MW-22

Sample Location		MW-22			MW-22			MW-22			MW-22			MW-22			MW-22			MW-22			MW-22			MW-22			MW-22		
Lab ID		899041			901490			904497			913624			921496			939943			967309			981434			997749			4043-4		
Sample Date		2/12/2008			2/26/2008			3/11/2008			4/17/2008			5/20/2008			7/31/2008			11/14/2008			1/29/2009			4/23/2009			7/22/2009		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater		
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Volatiles																															
Benzene	ug/L	2.5		2	0.8	J	1	0.7	J	1	0.8	J	1	0.6	J	1	0.4	J	1	0.6	J	1	0.5	J	1	0.9	J	1	0.33	J	1
Total Metals																															
Magnesium	ug/L		NA			NA			NA			NA		23000		42	20900		33.6		NA		23400		33.6	24200		70	23700		5000
Conventionals																															
Alkalinity	mg/L		NA			NA			NA		213		5	176		5	185		5		NA		251		5	218		5	238		5
Alkalinity - Bicarbonate	mg/L	224		5	187		5	190		5	213		5	176		5	185		5	237		5	251		5	218		5	238		5
Alkalinity - Carbonate	mg/L		U	5		U	5		U	5		U	5		U	5		U	5		U	5		U	5		U	5		U	5
Carbon Dioxide	mg/L		NA			NA			NA			NA		22.2	J	5	31.5	R	5		NA		34.3		5	55.9	R	5	25.4	R	5

Sample Location		MW-22			MW-22			MW-22			MW-22			MW-22		
Lab ID		8218-1			9738-4			12520-1			460-16814-1			21272-1		
Sample Date		11/20/2009			1/14/2010			4/22/2010			8/26/2010			12/16/2010		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater			Groundwater		
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Volatiles																
Benzene	ug/L	1.3		1	0.79		1	9.2*		1	0.66	J	1	0.34	J	
Total Metals																
Magnesium	ug/L	22500		5000	20100		5000	21100		5000	20800		5000	18900		
Conventionals																
Alkalinity	mg/L	223		5	211		5	207		5	204		5	217		
Alkalinity - Bicarbonate	mg/L	223		5	211		5	207		5	204		5	217		
Alkalinity - Carbonate	mg/L		U	5		U	5		U	5		U	5		U	
Carbon Dioxide	mg/L	32.4	R	5	39	R	5	0.13	R	5	32.6	R	5	55.1		

* = Resampled on June 30, 2010 to verify this result, resample result was 11 ug/L.

Q - qualifier, RL - reporting limit, J - estimated, U - not detected, UJ - estimated reporting limit, NA - not analyzed

GROUNDWATER TREATMENT SYSTEM
BENZENE CONCENTRATIONS FOR MONITORING WELL 22
Paoli Rail Yard Superfund Site
Paoli, Pennsylvania

Sample Date	Units	Result	Q	RL
1/7/2005	µg/L	62		25
2/11/2005	µg/L	36		10
3/10/2005	µg/L	30		6.2
4/4/2005	µg/L	250		20
4/11/2005	µg/L	600		25
5/5/2005	µg/L	110		8.2
6/2/2005	µg/L	54		6.6
7/11/2005	µg/L	44	J	50
7/13/2005	µg/L	26		1.6
8/1/2005	µg/L	24		20
9/8/2005	µg/L	33		25
10/6/2005	µg/L	23		10
10/28/2005	µg/L	5.4		5
11/8/2005	µg/L	35		20
12/7/2005	µg/L	1000		20
1/6/2006	µg/L	1.9	J	2
1/10/2006	µg/L	47		20
2/7/2006	µg/L	29		20
3/6/2006	µg/L	23		1
4/7/2006	µg/L	3.2	J	5
4/14/2006	µg/L	25		10
5/8/2006	µg/L	18		10
6/7/2006	µg/L	17	J	20
7/3/2006	µg/L	24		5
8/9/2006	µg/L	6.2		2
8/24/2006	µg/L	6.6		5
9/12/2006	µg/L	37		10
10/14/2006	µg/L	24		10
11/7/2006	µg/L	23		10
12/6/2006	µg/L	36		1
12/22/2006	µg/L	10		2
1/3/2007	µg/L	15		5
2/2/2007	µg/L	10		10
2/9/2007	µg/L	6.4		1
3/5/2007	µg/L	18		1
4/2/2007	µg/L	21		1
4/5/2007	µg/L	9.9		5
5/4/2007	µg/L	23		5
6/1/2007	µg/L	11		2
7/16/2007	µg/L	10		10
7/19/2007	µg/L	8		5
8/9/2007	µg/L	27		10
9/6/2007	µg/L	18		1
10/2/2007	µg/L	6.1	J	10
11/2/2007	µg/L	18		2

Notes:
Q - Qualifier, RL - Reporting limit
J - Estimated